

**SPRINTER**

**BODY BUILDER'S INFORMATION BOOK**

# **Introduction**

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## **DaimlerChrysler Motors Corporation and DaimlerChrysler Vans Body Builders Information Book**

This is the 2005 - 2006 Body Builders Information Book for DaimlerChrysler Motors Corporation (DCMC) and DaimlerChrysler Vans (DCV) Sprinter vans and cab chassis.

This publication provides Body Builders who modify or install equipment in Dodge & Freightliner Sprinters Engineering specifications and assists them with their regulatory responsibilities.

The specifications and descriptions contained in this book, including regulatory information, are believed to be accurate at time of publication. Nevertheless Body Builders should consult with legal counsel to ensure compliance of pertinent laws and regulations. Periodically this book will be updated as new products are introduced and additional information regarding these products become available.

Upon written request DCMC and DCV's designee set forth below will provide certain additional technical data.

**DaimlerChrysler Manufacturing International LLC**

Att.: Engineering & Compliance Department  
8936 NorthPointe Executive Drive, Suite 200  
Huntersville, NC 28078

Fax: (704) 655-1055

Prior to making any modification to or installing any equipment in or on a Sprinter, read this Information Book, and if necessary, consult with DaimlerChrysler Manufacturing International LLC's Engineering and Compliance Department (DCMI).

Copies of this book may be obtained through the following websites:

[www.fl-sprinter.com/Customer/manuals](http://www.fl-sprinter.com/Customer/manuals)

[www.dodge.com/bodybuilder](http://www.dodge.com/bodybuilder)

# Introduction

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## Definitions

**Body Builders** include Final-Stage Manufacturers, Intermediate Manufacturers, Incomplete Vehicle Manufacturers, Vehicle Alterers and component suppliers.

**Complete Vehicle** means a vehicle that requires no further manufacturing operations to perform its intended function, other than the addition of readily attachable components, such as mirrors, tires or tire and rim assemblies, or finishing operations such as painting.

**Completed Sprinters “As Delivered”** means Sprinters manufactured by DCAG, reassembled if necessary by DCAG's designee, certified to comply with all applicable laws and regulations and delivered as a complete vehicle (Cargo & Passenger Vans) to Dealers, Body Builders and others engaged in the manufacturing and marketing of new motor vehicles and equipment.

**DaimlerChrysler Group (DCG) Parts** means genuine parts, accessories for installation on or attached to vehicles, components, aggregates, assemblies, including those for exchange or replacement, which are supplied by or through DCMC, DCV or any of its parent companies, affiliates or subsidiaries.

**Dealers** means entities authorized by DCMC and DCV to sell and service Sprinters.

**Final-Stage Manufacturer** means a person who performs such manufacturing operations on an incomplete vehicle that it becomes a completed vehicle.

**Incomplete Vehicle** means an assemblage consisting, as a minimum, of a frame and chassis structure, power train, steering system, suspension system and braking system, to the extent that those systems are to be part of the completed vehicle, that requires further manufacturing operations, other than the addition of readily attachable components, such as mirrors or tire and rim assemblies, or minor finishing operations such as painting, to become a Completed Vehicle.

**Incomplete Vehicle Manufacturer** means a person who manufactures an incomplete vehicle by assembling components none of which, taken separately, constitute an incomplete vehicle.

**Vehicle Alterer** is a person or company who modifies a previously certified vehicle other than by the addition, substitution or removal of readily attachable components. Readily attachable components can mean mirrors, tire and rim assemblies, or minor finishing operations such as painting.

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## Important Information

### Regulatory Requirements:

The U.S. and Canadian Governments have established emission standards and motor vehicle safety standards for new engines and/or new vehicles and equipment, under the provisions of the Clean Air Act, the Noise Control Act and the National Traffic and Motor Vehicle Safety Act in the U.S., and the Canadian Motor Vehicle Safety Act in Canada ("Acts"). The Acts govern original equipment manufacturers of the Dodge & Freightliner Sprinter vans, dealers, Body Builders and others engaged in the manufacturing and marketing of new motor vehicles and equipment.

Specifically, Part 568 of the Title 49 Code of Federal Regulations (CFR) specify detailed regulatory requirements for vehicles manufactured in two or more stages, including Final Stage Manufacturers. This document is intended to fulfill a part of DCAG's obligations as the original equipment manufacturer, or as an incomplete vehicle manufacturer. Section 1.3, Emission and Safety, identifies regulatory requirements to assist Intermediate and Final Stage Manufacturers, in determining their obligations to conform with these standards.

Completed Sprinters "As Delivered", are certified to comply with the aforementioned applicable standards. Compliance labels affixed to Sprinters and engines, provide the status of initial compliance at the date of manufactured by DCAG. Body Builders and Dealers who

makes any modifications which may affect the final certification of the engine, vehicle or equipment assume the sole responsibility for the vehicle.

**Body Builders should consult with legal counsel concerning the final certification status of the vehicle.**

Further it is the Body Builder's responsibility to ensure that such modifications do not affect the safety of the vehicle. Contact the Environmental Protection Agency (U.S. EPA) & the California Air Resources Board (CARB) concerning the applicable U.S. & California exhaust emissions and noise standards, and the National Highway Traffic Safety Administration (NHTSA) concerning the applicable U.S. vehicle safety standards. For Canadian standards contact Environment Canada and Transport Canada respectively.

1. Upon completion of the modified vehicle, the Body Builder is required by law (Title 49 of the Code of Federal Regulations S567.7 in the United States, the Clean Air Act section 203 (a), and under provisions of, EPA CFR Part 86 section 86.09911; Emissions standards for 1999 and later model year diesel heavy-duty engines and vehicles) to certify that it continues to comply with all applicable Federal and Canada Motor Vehicle Safety Standards/Regulations. In addition, the modified vehicle must continue to comply with all applicable Federal, Canada and/or California Emissions regulations. In the United States, sale of a non-complying new vehicle is illegal and is punishable

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by a fine of up to \$25,000 (Federal) and \$5,000 (California) per vehicle for emissions non-compliance, \$1,000 per vehicle for safety non-compliance, plus a recall and other sanctions.

2. The Body Builder is responsible for certifying the altered vehicle pursuant to Title 49 of the Code of Federal Regulations S567.7 and S568.8 in the United States or to Section 9 of the Canada Motor Vehicle Safety Regulations in Canada.
3. DaimlerChrysler makes no representations with regard to conformity of the altered vehicle to any other Federal or Canada Motor Vehicle Safety Standards or Regulations that may be affected by the vehicle alteration; it is the responsibility of the Body Builder to certify that the vehicle conforms to any other standards affected by the vehicle alteration.

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## **Warranty and Vehicle Safe Operation:**

DCAG requires the use of Genuine DCG parts and DCG replacement & conversion Parts, or replacement & conversion Parts and accessories expressly approved by the Sprinter van manufacturer in order for Body Builders to maintain regulatory compliance of these components or equipment, as well as the durable and safe operation of Sprinters. In areas beyond regulatory compliance, Body Builders may elect to use other parts or conversion parts or accessories and assume the Manufacturers' warranty of these parts themselves. If these conversion parts cause damage to the original DCG Parts, the warranty of these original DCG Parts is void. It is the Body Builder's responsibility to ensure that non-approved replacement conversion parts & accessories does not render the vehicle unsafe.

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## General Information

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# General Information

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## 1.1 Vehicle and Model Designations

This Body Information Book covers the following vehicles:

Vehicle Name	Type	Wheel Base	Roof Height
Sprinter Passenger Van	<b>2500</b>	<b>118"</b>	<b>Standard</b>
		<b>140"</b>	<b>Standard</b>
		<b>118"</b>	<b>High</b>
		<b>140"</b>	<b>High</b>
		<b>158"</b>	<b>High</b>
Sprinter Cargo Van	<b>2500</b>	<b>118"</b>	<b>Standard</b>
		<b>140"</b>	<b>Standard</b>
		<b>118"</b>	<b>High</b>
		<b>140"</b>	<b>High</b>
		<b>158"</b>	<b>High</b>
	<b>3500</b>	<b>140"</b>	<b>Standard</b>
		<b>140"</b>	<b>High</b>
		<b>158"</b>	<b>High</b>

Note: All 3500 Sprints come with Dual Rear Wheels as standard

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Vehicle Name	Type	Wheel Base	Roof Height
Sprinter Cab-Chassis	<b>2500</b>	<b>140"</b>	---
		<b>158"</b>	---
	<b>3500</b>	<b>140"</b>	---
		<b>158"</b>	---

Note: All 3500 Sprinters come with Dual Rear Wheels as standard

# General Information

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## 1.2 Sprinter Vehicle Identification Number (VIN) Code Sample

WD 8 B D1 44 4 5 5 999999

Sequentially Assigned Vehicle Serial Number by the Plant of Manufacture

Vehicle Manufacture Plant: 5 = Duesseldorf, Germany

Model Year Designation: 5 = 2005, 6 = 2006, 7 = 2007

Check Digit for VIN Verification

Engine/Fuel/Displacement/Configuration/Brake:

44 = MB OM647LA(50-State)/Diesel/2.7L/I-5/Hydraulic

Model/Wheelbase/Wheelsize/GVWR/Class:

D1 = C2,500;P2,500/3000 mm/15"/8,001 to 9,000lbs./G

D4 = C3,500/3,550mm/15"/9,001 to 10,000lbs./H

D5 = C3,500/4,025mm/15"/9,001 to 10,000lbs./H

D6 = 2,500C;C2,500;P2,500/3,567mm/16"/8,001 to 9,000lbs./G

D7 = 2,500C;C2,500;P2,500/4,042mm/16"/8,001 to 9,000lbs./G

D8 = 3,500C/3,567mm/16"/10,001 to 14,000lbs./3

D9 = 3,500C/4,042mm/16"/10,001 to 14,000lbs./3

Chassis Configuration: P = All 4x2 Vehicle Types / U.S.

Chassis Configuration: B = All 4x2 Vehicle Types / Canada

Vehicle Type Dodge: 0 = Truck, 8 = Multipurpose Passenger Vehicle (MPV), W = Bus, X = Incomplete

Vehicle Type Freightliner: P = Incomplete, R = Multipurpose Passenger Vehicle (MPV), Y = Truck

World Manufacturer Identification

## **1.3 Emissions and Safety Information**

A Complete Sprinter Van "As Delivered" or a cab chassis, i.e., an incomplete vehicle, delivered by DCMC or DCV to Dealers or Body Builders is certified for by DCAG for compliance with the U.S. and Canadian emissions and safety standards at the time of manufacture. If this vehicle is altered, after delivery by DCMC or DCV, Body Builders and/or Dealers assume the regulatory responsibility for certification.

This Section provides general information concerning applicable emissions and safety standards at the time of the vehicle manufacture. This section is written to assist Body Builders in understanding the U.S. EPA and the CARB exhaust emission and noise standards, Federal Motor Vehicle Safety Standards (FMVSS) and Canadian Motor Vehicle Safety Standards (CMVSS). DCMI neither approves or recommends any modifications or additions to the Sprinter vehicle, which may cause noncompliance with any EPA or FMVSS or CMVSS standards, or render the vehicle unsafe.

Questions concerning the content of this Section can be directed to DCMC or DCV's designee set forth below:

Compliance Specialist, DaimlerChrysler Manufacturing International LLC, Telephone (704) 655-1052.

Body Builder should, however, consult with an attorney concerning interpretations of the applicable laws and regulations and determine if the modification Body Builder made to the Sprinter may affect the final certification or compliance of the vehicle. Further, it is the Body Builder's responsibility to ensure modifications do not render the vehicle unsafe.

### **1.3.1 Exhaust Emission Control Information**

The Sprinter engines, Mercedes-Benz OM612LA, or OM647LA, are certified with the U.S. EPA and the Environment Canada, or the CARB, to comply with the heavy-duty diesel engine exhaust emission standards under Title II, Section 206 of the Clean Air Act and 40 CFR Part 86 regulations. Proof of this EPA certification is shown by an exhaust emission control label, i.e., an "Important Engine Information" label, see **Section 1.4**, affixed to the rocker cover of the engine.

Provisions of the EPA regulations require that the emission-related components function in-use over the prescribed full useful life period as certified, i.e., 8 years or 110,000 miles, whichever occurs first. To be certain that these components function properly, the end users are required to use appropriate fuels and lubricants and maintain these components properly in accordance with the Operator's Manual and Service Booklet. In addition,

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engine calibrations, such as fuel output settings, injection timings, emission control device calibration and location, charge air and cooling system calibration and location are prohibited from any alterations from the certified configurations.

Provisions of the Clean Air Act also prohibit any persons, including but not limited to, Dealers or Body Builders to remove or render inoperative any devices or elements of design installed in a motor vehicle engine in compliance with the regulations. Please refer to **Section 8 Exhaust System** for further information.

## 1.3.2 Vehicle Noise Emission Control Information

The Noise Control Act of 1972 and the 40 CFR Part 205 U.S. EPA regulations, "Transportation Equipment Noise Emission Controls", require new medium and heavy trucks over 10,000 lbs. GVWR to comply with an exterior drive-by noise standard of 80 dB(A). In Canada, CMVSS 1106 Noise Emissions Standard requires an additional interior sound level certification at 90 dB(A). All Sprinter vehicles now offered in the NAFTA market are rated at below 10,000 lbs. GVWR. Some future Sprinter vehicles may be rated above 10,000 lbs. GVWR, thus, they will be subject to these noise certification requirements with the vehicle noise emission label affixed. Nevertheless, all Sprinter vehicles come equipped with extensive

applicable noise control packages, which were tested at over 100% reduction in noise levels below the aforementioned noise standards. Final Stage Manufacturers should consult with their attorney concerning the compliance of their vehicles with appropriate regulations and laws, once they are altered or modified.

The law and regulations prohibit tampering with noise control devices or components. Specifically, the removal or rendering inoperative of any devices or elements of design incorporated into any new vehicle for the purpose of noise control is not permitted. Such devices or elements are identified as noise emission related components, such as engine calibrations including governor settings, exhaust system components, air induction system components, radiator shield, fan/drive, noise shields or acoustical absorptive material, etc. The regulations also require maintenance of the noise control performance in use, to comply with the U.S. EPA 40 CFR Part 202, or DOT 49 CFR Part 325, Exterior Drive-By Noise Emission Standards for Interstate Motor Carrier.

## 1.3.3 Vehicle Safety Standards Information

In the U. S., National Traffic and Motor Vehicle Safety Act of 1966 and NHTSA's FMVSS regulations and in Canada, Motor Safety Act of 1993 and Transport Canada's (TC)

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CMVSS, identify certain requirements and certification responsibilities for the various stages of vehicle manufacturing. Therefore, Body Builders and Dealers need to review all regulatory requirements carefully to ensure compliance with applicable standards.

Please consult with an attorney to ensure compliance with applicable laws or standards.

## **1.3.3.1 FMVSS 101 / CMVSS 101**

This vehicle, when completed, will conform to Standard 101, Controls and Displays, provided that no alterations are made to the vehicle controls, which are installed on the vehicle and covered by the standard. Alterations include location identification and/or illumination of the controls.

## **1.3.3.2 FMVSS 102 / CMVSS 102**

This vehicle, when completed, will conform to Standard 102, Transmission Shift Level Sequence, Starter Interlock and Transmission Braking Effect, if no alterations are made to the transmission, transmission controls, connecting linkages and cables, starting motor wiring or plumbing, neutral safety switch and ignition or equivalent switch and related wiring, or shift level position identifications.

## **1.3.3.3 FMVSS 103 / CMVSS 103**

This vehicle, when completed, will conform to Standard 103, Windshield Defrosting and Defogging Systems, if no alterations are made to the windshield defrosting and defogging systems, controls, wiring plumbing, vehicle heater assembly, or the airflow to the windshield.

## **1.3.3.4 FMVSS 104 / CMVSS 104**

This vehicle, when completed, will conform to Standard 104, Windshield Wiper and Washing System, if no alterations are made to the windshield wiper arms, blades, washer, control, wiring, or plumbing.

## **1.3.3.5 FMVSS 105 / CMVSS 105**

This vehicle, when completed, will conform to Standard 105, Hydraulic Brake System, if none of the gross axle (GAWR) or gross vehicle weight ratings (GVWR) are exceeded, or if no alterations are made to affect the braking system, hydraulic system components and fittings, the anti lock system components or electrical circuitry, tire size, or wheelbase. In addition, the center of gravity after modifications, or the combined centers of gravity of all added items by subsequent manufacturers must conform to requirements of Section 1.8.1 of the Body Builders Information Book on Calculation of Center of Gravity after Modifications.

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## **1.3.3.6 FMVSS 106 / CMVSS 106**

This vehicle, when completed, will conform to Standard 106, Brake Hoses, if no alterations are made to the hydraulic brake hoses, brake hose assemblies, or the brake hose fittings including the labeling on these components.

## **1.3.3.7 FMVSS 108 / CMVSS 108**

This vehicle, when completed, will conform to Standard 108, Lamps, Reflective Devices, and Associated Equipment, if no alterations are made to lamp assemblies and/or their mountings, or Reflective devices and/or their mountings and no obstructions are installed which limit visibility of any items.

## **1.3.3.8 FMVSS 110 / CMVSS 110**

The completed Sprinter as delivered starting production date of September 2004 conforms to standard 110, tire selection and rims specially concerning section 4.3 placard requirement, if no alterations are made to affect tire, GVWR, seating capacity and combined weight of occupants and cargo.

## **1.3.3.9 FMVSS 111 / CMVSS 111**

This vehicle, when completed, will conform to Standard 111, Rearview Mirrors, if no alterations are made to mirrors, mounts, locations or cab structures, or no

obstructions are installed which limits the full function of these mirrors.

## **1.3.3.10 FMVSS 113 / CMVSS 113**

This vehicle, when completed, will conform to Standard 113, Hood Latch Systems, if no alterations are made in the hood latches, including the attachments to the hood latches.

## **1.3.3.11 FMVSS 114 / CMVSS 114**

This vehicle, when completed, will conform to Standard 114, Theft Protection, if no alterations are made to the steering column lock, transmission shift linkage, ignition switch interlock or the audible key-left-in warning systems.

## **1.3.3.12 FMVSS 116 / CMVSS 116**

This vehicle, when completed, will conform to Standard 116, Motor Vehicle Brake Fluids, if no alterations, substitutions, or introduction of foreign materials are made to the brake fluid. Use only heavy duty fluid, DOT 4+, if additional fluid is needed.

## **1.3.3.13 FMVSS 118 / CMVSS 118**

If so equipped, this vehicle, when completed, will conform to Standard 118, Power-Operated Window, Partition, and Roof Panel Systems, if no alterations are made to the power window and related electrical systems. Additional

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compliance with the Standard 118 is necessary, if subsequent alterations or installations are made.

## **1.3.3.14 FMVSS 119 / CMVSS 119**

This vehicle, when completed, will conform to Standard 119, New Pneumatic Tires for Motor Vehicles Other Than Passenger Cars, if tires maximum load ratings are not exceeded, and no alterations or substitutions of tires, including labeling are made.

## **1.3.3.15 FMVSS 120 / CMVSS 120**

This vehicle, when completed, will conform to Standard 120, Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars, if the GAWR or GVWR are not exceeded, and no alterations or substitutions are made to tires, rims or labeling.

## **1.3.3.16 FMVSS 124 / CMVSS 124**

This vehicle, when completed, will conform to Standard 124, Accelerator Control Systems, if no alterations are made to any components of the throttle control or fuel metering system.

## **1.3.3.17 FMVSS 201 / CMVSS 201**

This vehicle, when completed, will conform to Standard 201, Occupant Protection in Interior Impact, if no alterations are made to the instrument panel, instrument panel interior compartment door, front door-mounted

armrests, sun visors, seats and armrests, or other interior trims. Vehicles ordered with a D62 option, must be retrofitted with a partition wall to comply with this Safety Standard.

## **1.3.3.18 FMVSS 202 / CMVSS 202**

This vehicle, when completed, will conform to Standard 202, Head Restraints, if no alterations are made to the seat or head restraint.

## **1.3.3.19 FMVSS 204 / CMVSS 204**

This vehicle, when completed, will conform to Standard 204, Steering Control Rearward Displacement, if no alterations are made to the steering control system, including but not limited to steering wheel, steering column assembly, front structure, bumper and attaching parts, or any other frontal components.

## **1.3.3.20 FMVSS 205 / CMVSS 205**

This vehicle, when completed, will conform to Standard 205, Glazing Materials, if no alterations are made in the glazing material installed in the windshield, or windows of the cab, or of the passenger compartment.

## **1.3.3.21 FMVSS 206 / CMVSS 206**

This vehicle, when completed, will conform to Standard 206, Door Locks and Door Retention Components, if no alterations are made to the door assembly, door latches,

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door hinges, door locks, door latch posts, door hinge posts, other attachments or supporting cab structure.

## **1.3.3.22 FMVSS 207 / CMVSS 207**

This vehicle, when completed, will conform to Standard 207, Seating Systems, if no alterations are made to the seats, seat tracks, seat adjusters, restraining devices, release and adjustment controls, seat risers and supports, or the cab floor and supporting structure.

## **1.3.3.23 FMVSS 208 / CMVSS 208**

This vehicle, when completed, will conform to Standard 208, Occupant Crash Protection, if no alterations are made to the seat locations, seat belt assemblies, seat belt anchorages, seats, seating anchorages, cab and supporting structure, cab underbody, or if no change is made in the number of designated occupants' seating positions provided.

## **1.3.3.24 FMVSS 209 / CMVSS 209**

This vehicle, when completed, will conform to Standard 209, Seat Belt Assemblies, if no alterations are made to the seat belt assemblies, seat belt anchorages and attachments, or the cab structure to which the anchorages are attached.

## **1.3.3.25 FMVSS 210 / CMVSS 210**

This vehicle, when completed, will conform to Standard 210, Seat Belt Assembly Anchorages, if no additional occupant seats or seat belt assembly anchorages are installed, or if no alterations are made to the anchorages or related structure components.

## **1.3.3.26 FMVSS 212 / CMVSS 212**

This vehicle, when completed, will conform to Standard 212, Windshield Mounting, if maximum unloaded vehicle weight does not exceed 6,600 lbs., or if no alterations are made to the windshield or the windshield mounting system.

## **1.3.3.27 FMVSS 214 / CMVSS 214**

The doors of the vehicle, when completed, will conform to Standard 214, Side Impact Protection, if no alterations are made to the doors, door frames, door latches, door hinges or mountings.

## **1.3.3.28 FMVSS 219 / CMVSS 219**

This vehicle, when completed, will conform to Standard 219, Windshield Zone Intrusion, if maximum unloaded vehicle weight does not exceed 6,600 lbs., or if no alterations are made to the hood mounting system and the "protected zone" is not penetrated.

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## **1.3.3.29 FMVSS 220 / CMVSS 220**

This vehicle when completed, will conform to Standard 220, School Bus Rollover Protection, if no alterations are made to the roof panel and its supporting structure, including roof rails, front header, roof bows or roof pillars, the door window frames, the windshield or its mounting system or any window frame, subsequent to the delivery by DCAG.

## **1.3.3.30 FMVSS 301 / CMVSS 301**

This vehicle, when completed, will conform to Standard 301, Fuel System Integrity, if maximum unloaded vehicle weight does not exceed 4,900 lbs. for cab chassis and 6,200 lbs. for passenger and cargo chassis or if no alterations are made to the fuel system or fuel filler pipe assembly. For cab chassis equipped with a body covering the complete fuel tank assembly in accordance with Section 2.11.1, the maximum unloaded vehicle weight is 6,200 lbs. Cargo and passenger vans produced in model year 2004 or later conform to FMVSS 301 with a maximum unloaded vehicle weight of 6,600 lbs.

## **1.3.3.31 FMVSS 302 / CMVSS 302**

This vehicle, when completed, will conform to Standard 302, Flammability of Interior Materials, if no alterations are made to any interior materials or if no non-conforming interior materials are added to the interior of the vehicle.

## **1.4 Labels**

The following compliance labels are required is to be affixed at the locations noted in diagrams below.

VIN Plate

Exhaust Emission Control Information Label

Complete Vehicle Certification Label

Incomplete Vehicle Certification Label

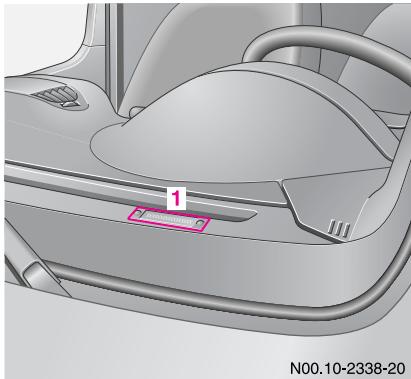
Air Bag Warning Label

Tire and Loading Information Label

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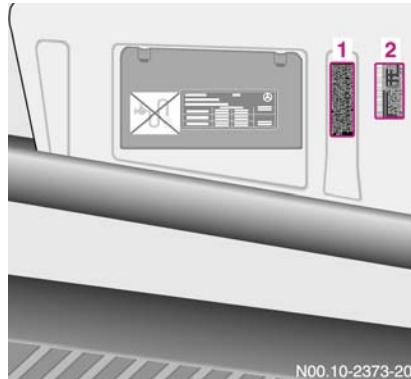
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## VIN Plate



1. Vehicle identification number  
Location: lower edge of windshield)

## Vehicle Safety Certification Label and Type Plate



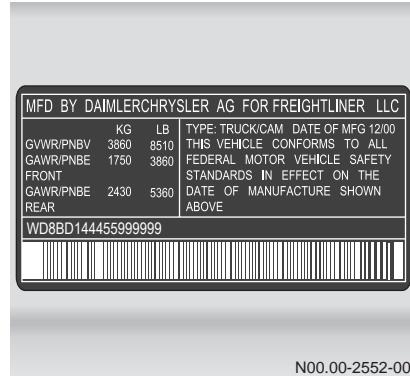
1. Incomplete vehicle certification label for chassis-cab.  
2. Type plate (vehicle identification number, permissible weights)  
Location: below the driver's seat on an outward facing position of the seat pedestal.

# General Information

## Exhaust Emission Control Information Label (Sample)

Important Engine Information				
This is a LOW EMISSION VEHICLE engine and meets all applicable requirements of US EPA CFFV as "ILEV" per 40 CFR 88 and CARB as "ULEV" per CCR 1956.8				
DaimlerChrysler AG, Stuttgart, Germany				
Mercedes-Benz Engine, Model	OM 647 LA CID 164			
Engine Family / Engine Code	4 MBXH2.69DJB / Code I			
Exhaust Emission Control System	TC, EMC, CAC, OC, EGR			
Date of engine manufacture	2004			
Advertised output (SAE gr.)	115 kW (154 HP) /3800 rpm			
Fuel rate at adv. Output	55 - 63 mm <sup>3</sup> / stroke			
Valve lash cold (ins.)	n.a. int. n.a. exh.			
Basic injection timing	14.5 ± 1 degrees BTDC			
Idle speed	680 ± 50 rpm			
This engine conforms to US, EPA, CARB and Canada regulations applicable to 2004 Model Year.				
This engine has a primary intended service application as a light HD diesel engine.				
This engine is not certified for use in an urban bus as defined at 40 CFR 86.093.-2. Sales of this engine for use in an urban bus is a violation of Federal Law under the Clean Air Act.				
This engine is certified to be operated on diesel fuel.				
Location: on valve cover of the engine				

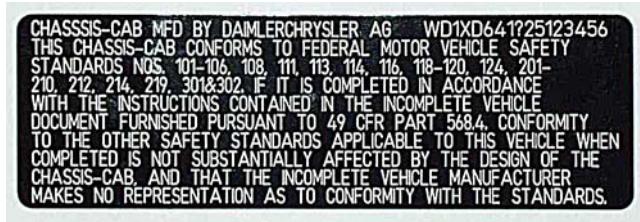
## Complete Vehicle Certification Label (Sample)



Location: below the driver's seat on an outwardfacing position of the mounting pillar.

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Incomplete Vehicle Certification Label (Sample)



Location: below the driver's seat on an outwardfacing position of the mounting pillar.

Air Bag Warning Label (Sample)



Location: on sun riser.

# General Information

## Tire and Loading Information Label



N00.10-2547-20

Location: on the driver's door B-pillar.



N00.10-2548-20

## Tire and Loading Information Label (Sample)

NOTE: Data shown on label are for illustration purposes only. Load limit data and seating data are specific to each vehicle and may vary from data shown in the illustration. Refer to label on vehicle for actual data specific to your vehicle.

For tire and loading information, see Chapter 12.

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## **1.5 Granting of Body Approval / Technical Assistance**

Modification by Body Builders must not affect safety of the Sprinter. DCMC and DCV, through their designee, DCMI, will offer technical assistance concerning DCMC and DCV Sprinter vans, including technical data & drawing and product info brochures, but it is the responsibility of Body Builders to ensure modifications do not affect safety of vehicle.

DCMC and DCV, through their designee, DCMI, neither approves nor disapproves Sprinter modifications or equipment installations made by Body Builders, or Dealers nor others since DCMC, DCV, and their designee, DCMI, do not control such Body Builders, manufacturing techniques nor assume the responsibility as the final stage manufacturer and consequential product liability.

To obtain technical assistance or information, please contact DCMC and DCV's designee:

Exc. Vice President of Engineering and Compliance

DaimlerChrysler Manufacturing International LLC  
8936 NorthPoint Executive Drive, Suite 200  
Huntersville, NC 28078

Telephone:(704) 655-1050  
Fax:(704) 655-1055

## 1.6 Body Builder Responsibilities

Each completed Sprinter "As Delivered" in the U.S. is certified for the U.S. EPA or CARB exhaust emissions in accordance with 40 CFR Part 86, or Title 13 of CCR, and an exhaust emission control information label is affixed thereto. While the complete Sprinter van "As Delivered" is certified to comply with the applicable FMVSS safety regulations in accordance with 49 CFR Section 567.4, and a complete vehicle certification label is affixed thereto, the cab chassis is certified to comply with the applicable FMVSS safety regulations in accordance with 49 CFR Section 567.5 and 568.4, and an incomplete vehicle certification label is affixed thereto. In addition, every individual Sprinter cab chassis contains an incomplete vehicle documentation information packet. Sprinter vehicles intended for Canada are similarly certified and labeled in accordance with the Canadian regulations.

Once these Sprinter vehicles are altered, or completed with the installation of additional equipment, Body Builders assume the responsibility of final certification to all applicable emissions and safety regulations, including labeling and documentation, affected by their modifications. **Section 1.3** of this Book provides Body Builder with general information concerning these modifications. Provisions of 49 CFR Sections 567.5

through 567.7, and 568.5 through 568.8 specifically set the regulatory responsibility for the Body Builders to comply with the vehicle safety standards. Body Builders should consult with legal counsel concerning these responsibilities.

Any alterations or installations by Body Builders must comply with the following:

1. Do not alter or modify Sprinter components forward of the rear cab wall for cab chassis or forward of the seating reference point for Sprinters, unless modifications are approved component installations (such as air conditioning, radio, etc.) which are manufactured, approved or endorsed by DCAG, DCMC, DCV or their designee, DCMI.
2. Do not alter the location or impair functional reliability and or the clearance of all movable chassis components, i.e., axles, springs, driveshafts, steering systems, braking systems, gearshift linkages, exhaust systems, etc.
3. Do not drill, alter, impair or damage the frame top and bottom flanges.
4. Do not alter, damage, or relocate the Sprinter fuel system, seat belt assemblies and anchorages, braking system and steering.

# General Information

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5. Do not impair the operational reliability, roadworthiness and driveability of the Sprinter by body or accessory equipment installation or modification.

Body Builder is responsible for ensuring that modification or equipment installation does not affect the safety of the Sprinter. DCMC, DCV, and DCMI are not responsible for any final certification or claims sounding in product liability or warranty claims, which result from any component, assembly, or system being altered, or which cause non-compliance with any of the emission control standards or motor vehicle safety standards, or which would otherwise cause the vehicle to be or become defective or unsafe.

## 1.7 Vehicle Rollover Stability Information

Rollover stability is an important consideration in the safety design of a vehicle. Stability is influenced by many factors including chassis and body configuration, suspension, axle track width, tire size, tire pressure, etc. The cargo type and weight (payload), the body size, shape, and center of gravity height are particularly important. **Therefore, alterations or installation of additional equipment to the Sprinter vehicles by any Body Builder or intermediate and/or final stage manufacturer may affect rollover stability of the vehicle.**

The Office of Vehicle Safety Research at NHTSA has conducted research and established guidelines to improve vehicle rollover stability. Body Builders are advised to consult with that Office and/or visit the NHTSA website for more information.

# General Information

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## 1.8 Center of Gravity

Center of Gravity of Sprinter Vans as delivered without optional Equipment:

Vehicle	Rim Diameter (*1)	WB [inch]	FA [lbs]	RA [lbs]	CW [lbs]	Center of Gravity [inch] (*2)			
						x	y	z	
Passenger Van 2500 GVWR 8,550 lbs	15"	118	2,739	1,918	4,657	48.66	-0.472	32.09	
		HR	118	2,752	1,954	4,705	49.06	-0.472	32.09
	16"	140	2,891	2,108	4,999	59.21	-0.472	34.06	
		HR	140	2,908	2,150	5,058	59.68	-0.472	34.06
		159	2,964	2,342	5,305	70.24	-0.472	34.06	

# General Information

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Vehicle	Rim Diameter (*1)	WB [inch]	FA [lbs]	RA [lbs]	CW [lbs]	Center of Gravity [inch] (*2)			
						x	y	z	
Cargo Van 2500 GVWR 8,550 lbs	15"	118	2,732	1,868	4,600	47.95	-0.472	32.09	
		HR	118	2,745	1,903	4,648	48.35	-0.472	32.09
	16"	140	2,867	2,068	4,935	59.33	-0.472	34.06	
		HR	140	2,882	2,108	4,990	59.33	-0.472	34.06
		159	2,933	2,309	5,241	70.08	-0.472	34.06	
Cargo Van 3500 GVWR 9,990 lbs	15"	140	2,900	2,267	5,166	61.34	-0.472	32.09	
		HR	140	2,919	2,302	5,221	61.61	-0.472	32.09
		158	2,961	2,498	5,460	72.52	-0.472	32.09	

# General Information

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Vehicle	Rim Diameter <sup>(*1)</sup>	WB [inch]	FA [lbs]	RA [lbs]	CW [lbs]	Center of Gravity [inch] <sup>(*2)</sup>		
						x	y	z
Sprinter Cab Chassis as delivered is certified with an maximum unloaded vehicle weight, when completed, of 4,900 lbs.								
Cab Chassis 2500, GVWR 8,550 lbs	15" <sup>(*3)</sup>	118	2,778	1,228	4,002	36.10	-0.472	25.00
	15" <sup>(*3)</sup>	140	2,860	1,173	4,033	40.67	-0.472	25.00
	15" <sup>(*3)</sup>	158	2,961	1,136	4,097	43.94	-0.472	25.00
	16"	140	2,913	1,226	4,139	41.61	-0.472	26.97
	16"	159	3,014	1,188	4,203	45.00	-0.472	26.97
Cab Chassis 3500, GVWR 10,200 lbs	16"	141	2,835	1,589	4,424			
	16"	159	2,934	1,601	4,535			

- HR              High Roof              <sup>\*1</sup>              - 15"-Wheel: 29.4 kg  
 WB              Wheel Base              <sup>\*2</sup>              - 16"-Wheel: +40% = 41.16 kg => 41kg  
 FA              Front Axle              x - from Middle of Front Axle  
 RA              Rear Axle              y - from Middle of vehicle  
 CW              Curb Weight              z - from tire contact at ground  
<sup>\*3</sup>              Spare wheel and mounting location were not considered

# General Information

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## 1.8.1 Extreme Permissible Positions of Center of Gravity

### Vehicles with ESP

x direction: < 2,400 mm referred to the front axle

y direction: When the vehicle is laden, the wheel load (1/2 of the axle load) may only be exceeded by 4%.

### Vehicles without ESP

x direction: Limit determined by the permissible axle loads

y direction: When the vehicle is laden, the wheel load (1/2 of the axle load) may only be exceeded by 4%.

### Height of center of gravity, z-direction

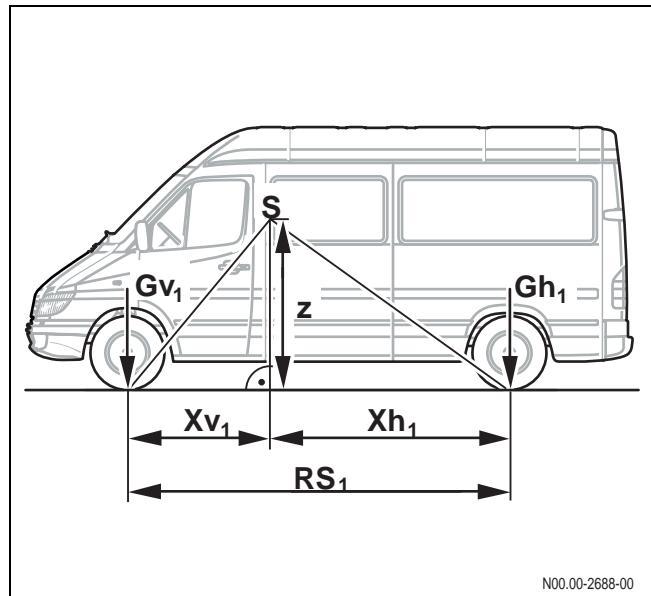
Gross vehicle weight [t] / Rim Diameter	Unladen with body [mm]	Laden [mm]
3.88/15"	815	1,100
3.88/16"	865	1,100

## 1.8.2 Calculating the Center of Gravity

After installation or modification of the equipment, vehicles must be weighed on a weighbridge in two different positions.

The axle loads must be weighed when the vehicle is horizontal ( $Gv_1$  and  $Gh_1$ ) and when one axle is raised by amount "a" ( $Gv_2$  and  $Gh_2$ ; we recommend  $a = 500$  mm). The wheelbase  $RS_1$  (3,000 mm, 3,550 mm or 4,025 mm) is defined by the vehicle model series (see Ordering) or must be measured using a rule.

### Measurement 1

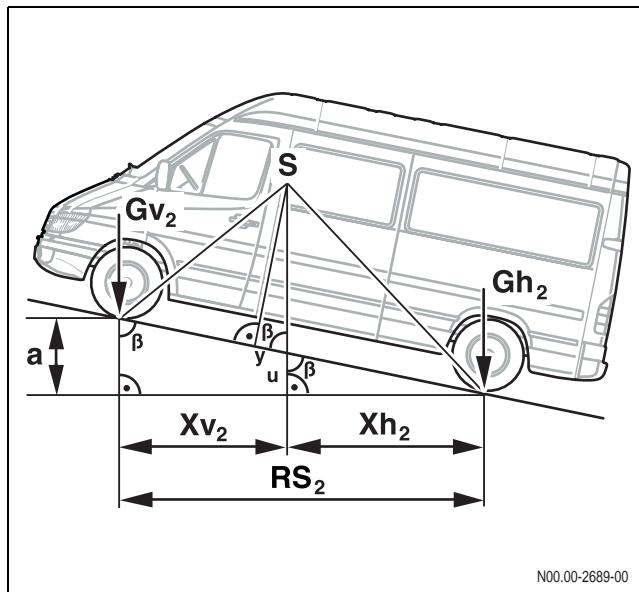


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# General Information

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## Measurement 2



$x_{v1}, x_{v2} \dots$  distance from centre to front axle,  
measurement 1/2

$x_{h1}, x_{h2} \dots$  distance from centre to rear axle,  
measurement 1/2

$v$  = front axle

$h$  = rear axle

# General Information

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The sum of all moments about a point is zero. Therefore:

$$Mh = 0$$

$$(Gv_1 + Gh_1)^*xh_1 = Gv_1^*RS_1 \quad (1)$$

$$xh_1 = \frac{Gv_1^*RS_1}{Gv_1 + Gh_1} \quad (2)$$

The "new" wheelbase  $RS_2$  after raising one axle is calculated as follows:

$$RS_2 = \sqrt{RS_1^2 - a^2} \quad (3)$$

$xh_2$  is calculated analogously to  $xh_1$ :

$$xh_2 = \frac{Gv_2^*RS_2}{Gv_2 + Gh_2} \quad (4)$$

The height of the center of gravity  $z$  is calculated from:

$$z = \tan \beta^* y \quad (5)$$

The unknown angle  $\beta$  can be calculated from:

$$\cos \beta = \frac{a}{RS_1} \quad (6),$$

Therefore, the following results for  $\beta$ :

$$\beta = \cos^{-1} \left( \frac{a}{RS_1} \right) \quad (7)$$

The required  $y$  is obtained from the equation:

$$y = xh_1 - \sqrt{u^2 + xh_2^2} \quad (8)$$

# General Information

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The values for  $xh_1$  and  $xh_2$  are already known from equations (2) and (4). The required  $\mathbf{u}$  is calculated using:

$$\frac{a}{RS_2} = \frac{u}{xh_2} \quad (9) \text{ and results in the following equation:}$$

$$u = \frac{a^* xh_2}{RS_2}$$

If equations (7) and (10) are used in equation (5) and are referred back to the given/measured values  $\mathbf{a}$ ,  $\mathbf{RS}_1$ ,  $\mathbf{Gv}_1$ ,  $\mathbf{Gh}_1$ ,  $\mathbf{Gv}_2$  and  $\mathbf{Gh}_2$ , the result for the height of the center of gravity  $\mathbf{z}$  is:

$$z = \tan \left[ \cos^{-1} \left( \frac{a}{RS_1} \right) \right] * \left( \frac{Gv_1 * RS_1}{Gv_1 + Gh_1} - \frac{Gv_2 * RS_1}{Gv_2 + Gh_2} \right)$$

# General Information

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## 1.9 Conversion Tables

### U.S. TO METRIC

Multiply:	by:	to get:	or by:	to get:	Multiply:	by:	to get:	or by:	to get:
<b>LINEAR</b>									
inches	x 25.4	= millimeters (mm)	x 0.03937	= inches	miles/gal	x 0.42514	= kilometers/liter (km/l)	x 2.3522	= miles/gal
inches	x 2.54	= centimeters(cm)	x 0.3937	= inches	gal/mile	x 2.3522	= liter/kilometers (l/km)	x 0.42514	= gal/mile
feet	x 0.3048	= meters(m)	x 3.281	= feet	gal/mile	x 235.22	= liter/100 kilometers (l/100km)	x 0.004251	= gal/mile
yards	x 0.9144	= meters(m)	x 39.37 inches or 3.281 feet		<b>POWER</b>				
miles	x 1.609	= kilometers (km)	x 0.6214	= miles	horsepower	x 0.746	= kilowatts (kW)	x 1.34	= horsepower
<b>AREA</b>									
sq inches	x 645.16	= sq millimeters (mm sq)	x 0.00155	= inches sq	ft-lb/min	x 0.0226	= watts (W)	x 44.25	= ft-lb/min
sq inches	x 6.4516	= sq centimeters(cm sq)	x 0.155	= inches sq	<b>TORQUE</b>				
sq feet	x 0.0929	= sq meters(m sq)	x 10.764	= feet sq	pound-inches	x 0.11298	= newton-meters (N*m)	x 8.851	= pound-inches
sq yard	x 0.8361	= sq meters(m sq)	x 1.196	= yards sq	pound-feet	x 1.3558	= newton-meters (N*m)	x 10.7376	= pound-feet
sq mile	x 259.0	= sq kilometers (km sq)	x 0.3861	= sq mile	<b>VELOCITY</b>				
<b>VOLUME</b>									
cu inches	x 16387.0	= cu millimeters (mm cu)	x 0.000061	= inches cu	miles/hour	x 1.6093	= kilometers/hour (km/h)	x 0.6214	= miles/hour
cu inches	x 16.387	= cu centimeters (cm cu)	x 0.06102	= inches cu	kilometers/hour	x 0.27778	= meters/sec (m/s)	x 3.600	= kilometers/hour
cu inches	x 0.01639	= liters (l)	x 61.024	= inches cu	miles/hour	x 0.4470	= meters/sec (m/s)	x 2.237	= miles/hour
quarts	x 0.94635	= liters (l)	x 1.0567	= quarts	<b>COMMON METRIC PREFIXES</b>				
gallons	x 3.7854	= liters (l)	x 0.2642	= gallons	mega (M)	=1,000,000	deci (d)	=0.1	
cu feet	x 28.317	= liters (l)	x 0.03531	= feet cu	kilo (k)	=1,000	centi (c)	=0.01	
cu feet	x 0.02832	= cu meters (m cu)	x 35.315	= feet cu	hecto (h)	=100	milli (m)	=0.001	
cu yard	x 0.07646	= cu meters (m cu)	x 1.308	= yards cu	deka (dk)	=10	micro (mc)	=0.000001	
fluid oz	x 29.57	= milliliters (ml)	x 0.03381	= fluid oz	<b>U.S./CANADIAN GALLON</b>				
<b>MASS</b>									
ounces (av)	x 28.35	= grams (g)	x 0.03527	= ounces (av)	1 U.S. Gallon	= .833 Canadian Gallon			
pounds (av)	x 0.4536	= kilograms (kg)	x 2.2046	= pounds (av)	1 Canadian Gallon	= 1.201 U.S. Gallon			
ton (2,000 lb)	x 907.18	= kilograms (kg)	x 0.001102	= ton (2,000 lb)					

### U.S. TO DECIMAL

1/32	0.03125	9/32	0.28125	17/32	0.53125	25/32	0.78125
1/16	0.0625	5/16	0.3125	9/16	0.5625	13/16	0.8125
3/32	0.09375	11/32	0.34375	19/32	0.59375	27/32	0.84375
1/8	0.125	3/8	0.375	5/8	0.625	7/8	0.875
5/32	0.15625	13/32	0.40625	21/32	0.65625	29/32	0.90625
3/16	0.1875	7/16	0.4375	11/16	0.6875	15/16	0.9375
7/32	0.21875	15/32	0.46875	23/32	0.71875	31/32	0.96875
1/4	0.25	1/2	0.5	3/4	0.75	1	1.0

## **General Information**

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# 2

## Body Installation

Chassis Dimensions .....	2.1
Cab Dimensions .....	2.1
Hood Dimension .....	2.1
Weight Distribution .....	2.1
Body Mounting Methods .....	2.2
Shelf support .....	2.2
Tire Envelope Clearance .....	2.3
Chain Clearance (Rear Axle) .....	2.3
Turning Radius .....	2.4
Paint Work .....	2.5
Additional Body Installation Requirements for Cab Chassis .....	2.5

# Body Installation

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Dimensions and weight of the Sprinter are based on the standard vehicle equipment:

Note weight tolerances allow up to + 5 % in production ISO 1176.



## WARNING

**Do not exceed permissible axle loads and gross vehicle weights. The permissible load and weights are listed on vehicle certification label, see section 2.4 of this manual. Exceeding the permissible axle loads and/or gross vehicle weights significantly impairs the vehicle's driving stability and handling characteristics and may cause serious injury or death.**

## 2.1 Chassis Dimensions

Observe all specifications in the offer drawings!

## 2.2 Cab Dimensions

Observe all specifications in the offer drawings!

## 2.3 Hood Dimension

Observe all specifications in the offer drawings!

## 2.4 Weight Distribution

Distribute weight evenly in vehicle, including front and rear, left and right of the vehicle. Ensure that tire load capacity GVW is within permissible loads listed below.

A front axle load of at least 25 % of the permissible gross vehicle weight must be maintained in all load states to ensure sufficient steerability of the vehicle. When a loading tail-gate is attached to the vehicle or when the vehicle is prepared to tow a single axle trailer (central axle trailer), at least 30 % of the gross vehicle weight must be borne by the front axle.

## 2.5 Body Mounting Methods

### 2.5.1 Bolted Connections

If the factory installed bolts have to be replaced with longer bolts, use only bolts with

- the same diameter
- the same strength class and
- the same thread pitch.

### 2.5.2 Welded Connections



#### WARNING

**Do not perform any welding work on assemblies, including but not limited to the engine, the transmission, the axles and the chassis frame.**

## 2.6 Shelf support

### Floor attachment

To avoid damage to the floor, the base plates of the shelf support struts (in front of the sidewalls) must be at least 120 mm wide and 3 mm thick. The y = 750 mm-line as well as the connection of the inner side wall assembly must be covered.

A 3 mm thick plate has to be inserted, which fits between the y = 750 mm-line and the vertical walls of the outer longitudinal stringer. Round off the edges of this plate to allow a proper fit of parts.

### Roof attachment

Use the vertical flange of the roof framework as the upper attachment points for the shelf support struts. The clamped length of the upper clamping connection must be at least 100 mm. Make sure that the outer clamping jaw does not clamp the upper crimped over edge of the flange.

### Roof

Spacing between the C-column-stick and a connector element should be at least 50 mm.

# Body Installation

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## 2.7 Tire Envelope Clearance

### 2.7.1 Snow Tires

Following any modification to the Sprinter body, Body Builder must ensure that only tires of the size approved for the Sprinter are installed. Allow at least tire envelope clearance, taking into consideration snow tires, anti-skid chains, as well as potential frame distortion.

Observe all specifications in the offer drawings!



#### WARNING

**Mounting tires, which are not approved by DCAG, for the Sprinter, that do not leave sufficient tire envelope clearance significantly impairs the vehicle's driving and braking characteristics and may ultimately lead to an accident, which can result in serious injury or death!**

## 2.7.2 Clearance for 2ND Body and Cab

Adequate clearance between the 2ND body and cab (minimum 50 mm, approx. 2 inch) must be maintained to ensure the safe operation of the Sprinter. Additional information can be obtained from DCMC and DCV's

designee, DaimlerChrysler Manufacturing International LLC.

## 2.8 Chain Clearance (Rear Axle)

For Cargo and Passenger Van:

Do not reduce the size of the wheel housing of the vehicle. Such reduction will impair the tire envelope clearance and movement of the tires and impair the use of chains.

For Cab Chassis:

Observe all specifications in the offer drawings!

## **2.9 Turning Radius**

Wheelbase	Turning Radius 15" Tires	Turning Radius 16" Tires
2500 SWB 118"	36.7 feet	not available
2500 MWB 140"	42.0 feet	44.6 feet
2500 LWB 158"	47.0 feet	49.5 feet
3500 MWB 140"	42.0 feet	44.6 feet
3500 LWB 158"	46.9 feet	49.5 feet

# Body Installation

## 2.10 Paint Work

To prevent discoloration when painting the body, check the suitability and compatibility of paint prior to performing any paintwork on the Sprinter.

Contact DCMC and DCV's designee, DaimlerChrysler Manufacturing International LLC, to inquire about color code for primer and paint.

Completely cover the following areas of the Sprinter before painting:

- Contact surfaces between the wheel disks and wheel hubs (in particular between the wheel disks on vehicles with dual wheels!)
- Contact surfaces for wheel lug nuts
- Coupling flanges for drive shafts
- Piston rods for hydraulic cylinders
- All control valves for the compressed air system
- Vents on transmission, axles, etc.
- Disk brakes

To avoid damage to vehicle equipment, do not exceed a temperature of 80° C (190° F) when drying the paint.



### WARNING

Disregarding these instructions can lead to malfunctions or failures of components, which can cause an accident and may ultimately result in serious injury or death!

## 2.11 Additional Body Installation Requirements for Cab Chassis

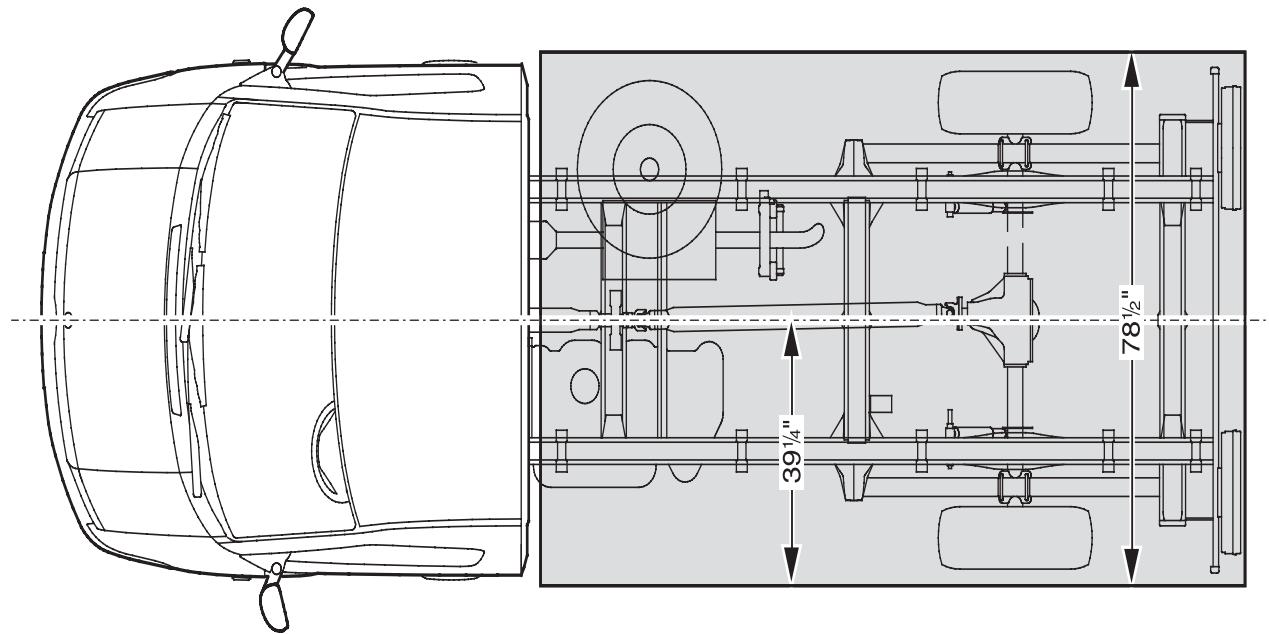
### 2.11.1 Width and Location of the Body to be Installed onto the Cab Chassis

Cab chassis with an unloaded vehicle weight over 4,900 and up to 6,200 lbs. must be equipped with a body with an overall width of 78 ½ ", or must be installed to extend 39 ¼ " from the centerline of the vehicle to the driver side, as shown in drawing page 2.6.

In addition, the lower outer edge of the body as installed, must not exceed 10" above the upper edge of the frame. The installed body has to have a minimum initial lateral rigidity of 2,000 N/mm.

# Body Installation

Width and Location of the Body to be Installed onto the Cab Chassis

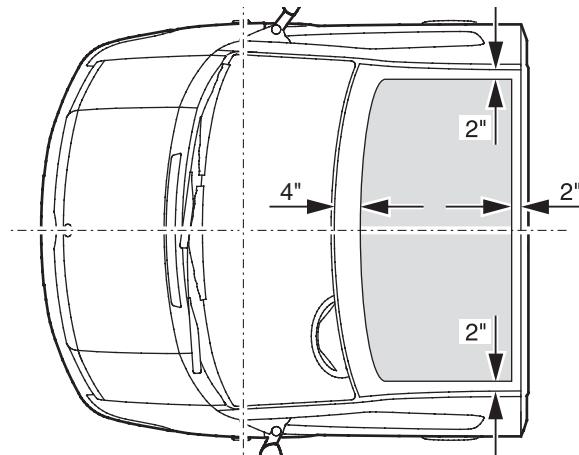


# **Body Installation**

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## **2.11.2 Location of the Clearance Lamps**

If the width of the body installed is 80 " or greater, Body Builders must install at minimum, 2 yellow clearance lamps/ 1 yellow identification lamp upfront, and 2 red clearance lamps/ 1 red identification lamp on the rear of the box to comply with FMVSS 108 and 49 CFR Part 568. It is recommended that Body Builders install the front lamps on the roof of the chassis cab within the shaded area as shown in Drawing YY.



# 3

## Frame and Chassis

Frame Specifications .....	3.1
Drilling Holes in Frame .....	3.1
Detachable Parts and Auxiliary Assemblies .....	3.2
Mounting Frame .....	3.3
Types of Bodies .....	3.11
Spare Tire .....	3.17

# Frame and Chassis

## 3.1 Frame Specifications



### WARNING

Do not alter the wheel base or lengthen the frame of the Sprinter Cargo Van or Passenger Van. Due to the vehicle's self- carrying structure, any such alteration may seriously harm its structural integrity, its road worthiness and the safety of the vehicle.

## 3.2 Drilling Holes in Frame

Never drill holes in the following areas of the Sprinter:

- In the top or bottom of the chassis frame. (Exceptions are holes at the rear and of the frame. However, these holes may not be drilled in areas with a supporting function for the rear axle or parts attached to the frame.)
- In the area of sectional changes in the longitudinal frame member, such as frame drops and frame offsets.
- At load introduction points (e.g, directly at the spring support).



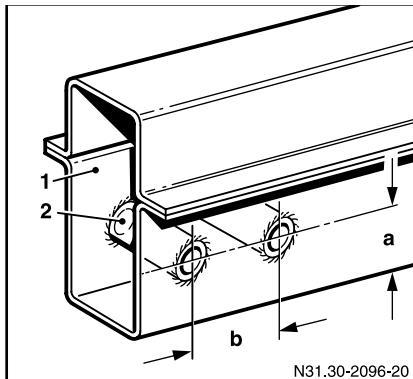
### WARNING

Do not drill holes in these areas. These holes may reduce the strength of the frame and may seriously affect structural integrity, its road worthiness and the safety of the vehicle.

For Cab Chassis only:

In special cases holes can be drilled in the web of the longitudinal frame member.

- Distance "a": at least 20% of frame height
- Distance between holes "b": at least 50 mm
- Maximum hole diameter "d": 15 mm



## 3.3 Detachable Parts and Auxiliary Assemblies

### 3.3.1 Mounting on the Sprinter Chassis Frame

- All auxiliary assemblies must be secured to mounting brackets.
- If using bolted connections, spacer must be weldable.

### 3.3.2 Chocks

Observe all applicable statutes and regulations as well as technical guidelines prior to attaching chocks to the Sprinter. In order to avoid rattling noise, install the chocks in suitable mounts. Sufficiently secure the chocks and ensure chocks are easily accessible.

# Frame and Chassis

## 3.4 Mounting Frame

- A mounting frame or structure with the function of a mounting frame is required for all 2ND bodies for proper connection between the chassis and body (exception: self-supporting bodies and mounting frames as floor assembly).
- The longitudinal frame members should be level and contact the upper cord of chassis frame, following the course of the frame.
- For 10,200 GVWR Sprinter, types 3 500:  
The longitudinal chassis-frame members are bent inwards in the area of the rear axle. The 2ND body longitudinal frame members do not have to follow this bend, but may continue though in a straight line.  
**Do not use wood strips between the longitudinal chassis-frame and longitudinal 2ND frame members.**
- Position mounting frame cross members above the chassis frame cross members.
- Use bevelled U-Channels for the longitudinal members or commercially available U-channels for closed box section vehicle design (do not use rolled steel channels).
- The dimension for the longitudinal members can be calculated from the required moment of resistance ( $W_x$ ) for the body and the chassis. See diagram on page 3.6 (Section 3.4.3).

The specified sectional models and channel dimensions assume that the longitudinal frame members are loaded uniformly on both sides.

If a number of bodies are installed on one chassis (e.g. platform and loading tailgate), the greater of the specified moments of resistance must be used for the mounting frame.

**WARNING**  
Disregarding these directions may seriously harm the structural integrity of the vehicle, its road worthiness and its safety. This may lead to an accident and serious injury or death.

## 3.4.1 Material Quality

Material qualities for specified steel mounting frames:

- Mounting frames mounted with brackets (friction-locking) = St W 22 or St 37-2

Material	Tensile strength N/mm <sup>2</sup>	Breaking strain N/mm <sup>2</sup>
St W 22	> 360	210
St 37-2	> 360	235

Mounting frames of high strength steels must have at least the rigidity of steel mounting frames. The mounts must be friction-locking.

Aluminum platform superstructures:

- Observe information provided by the aluminum manufacturer.
- The longitudinal members, plank floor, floor panels and cross members must form one unibody unit.

## 3.4.2 Design

The transition of the channel at the front ends of the longitudinal members should be a gradual one.

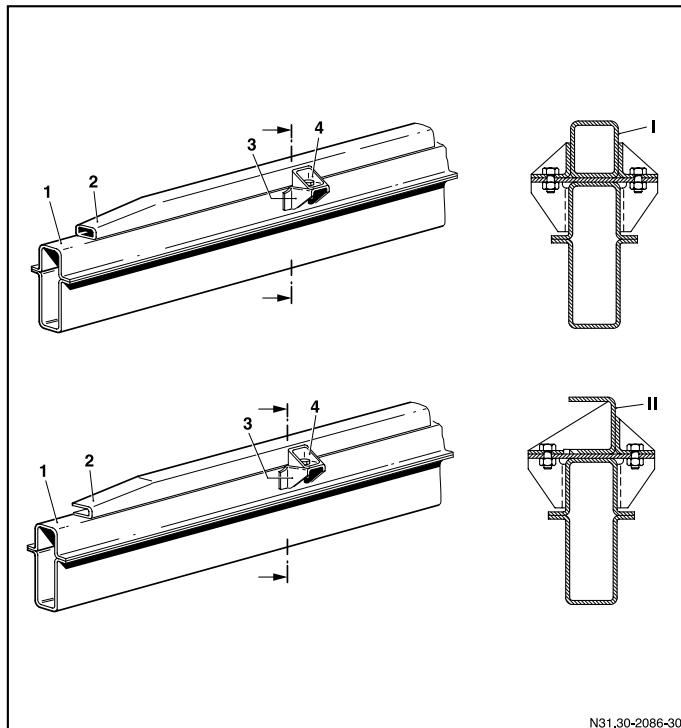
**If extremely high longitudinal members or an extremely low overall frame height is required, the U-channel can be designed as follows for friction-locking connections**

- As a closed box
- Inside overlapping or
- Overlapping

This increases the moment of resistance but also the torsional rigidity. Ensure good transition from closed longitudinal member to open U-channel.

# Frame and Chassis

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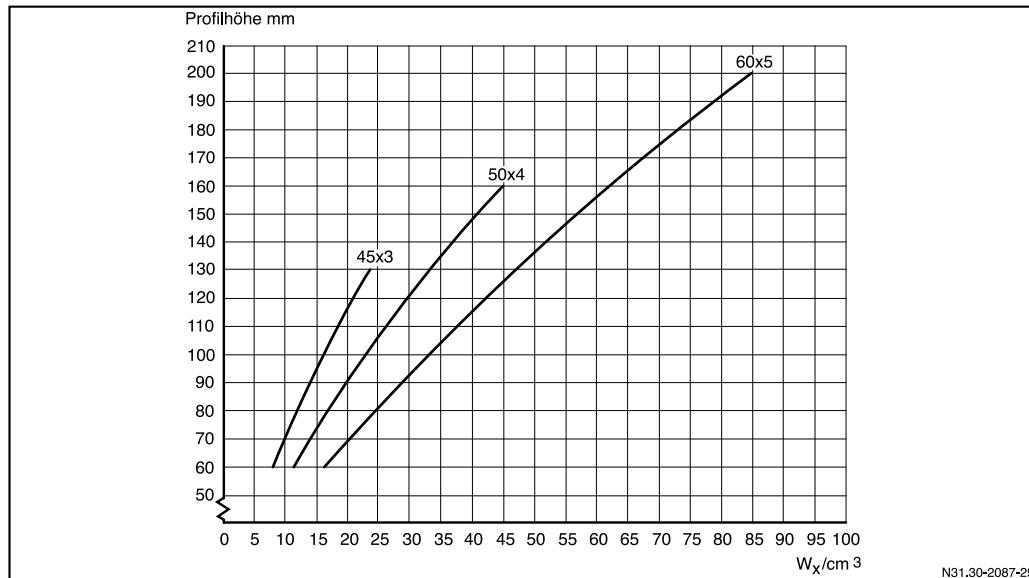
- I Box section
- II "C"-section
- 1 Chassis frame
- 2 2ND Body longitudinal frame
- 3 Standard mounting bracket
- 4 2ND Body mounting bracket

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## 3.4.3 Channel Dimensions

Channel dimensions for 2ND Body longitudinal frame members (open channel).

Mounting frames and chassis frames should have approximately the same material thickness and flange width.



$h$ : Channel height  
in mm  
 $W_x$ : Moment of  
resistance in  $\text{cm}^3$

# Frame and Chassis

---

## 3.4.4 Mounting

The mounting of the body to the chassis depends on the model, intended body, and the intended use of the vehicle.

Plan a sufficient number of mounts to take up the forces of braking and cornering.

Proper mounting is decisive for:

- The handling and operational safety of the vehicle, and
- The service life of the chassis frame and body.

For a friction-locking connection, the longitudinal members must be fixed in both longitudinal and lateral directions.

With prefabricated mounting frames take construction tolerances for chassis frame width into consideration (max. +6/-3 mm). Use shims to compensate for frame distortions (max. 6 mm) resulting from the manufacturing.

With rigid bodies, provide for resilient mounts in the cab (e.g. using cup springs or rubber mounted).

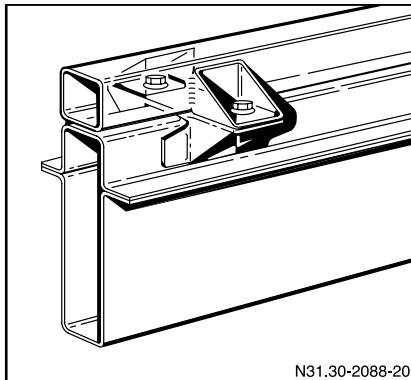
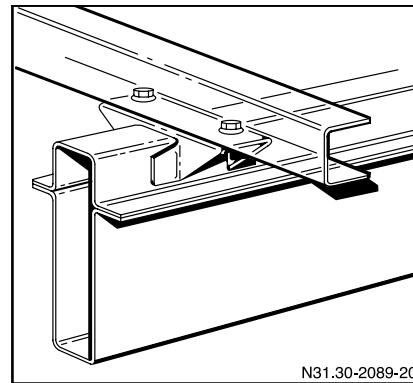


### WARNING

Disregarding these directions may seriously harm the structural integrity of the vehicle, its road worthiness and its safety. This may lead to an accident and serious injury or death.

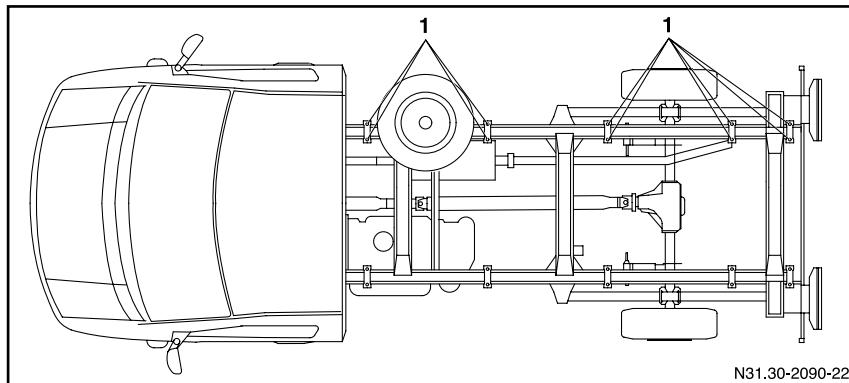
## 3.4.4.1 Friction-locking – Bracket mounting

- Limit movement of the longitudinal member in relation to the longitudinal chassis member whenever possible.
- Perform strength calculation separately for each longitudinal member.
- Distribute bending moment in accordance with moments of inertia.
- Secure the 2ND Body frame on the mounting brackets of the chassis frame. If additional securing points are required, use a shackle mount.



# Frame and Chassis

---

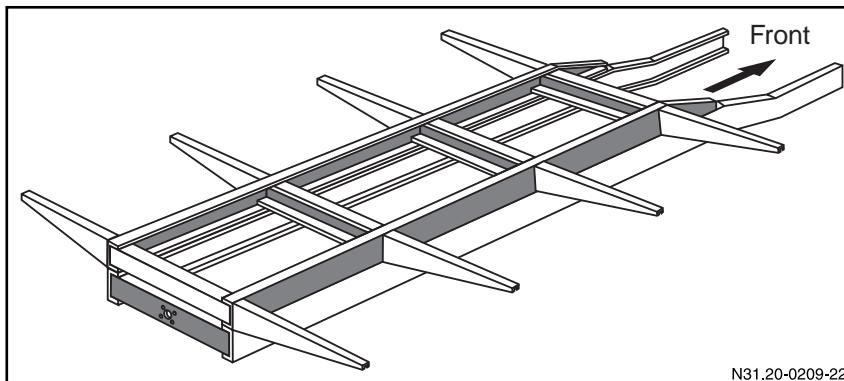


N31.30-2090-22

1. Body mounting brackets

## 3.4.5 Mounting Frame as Floor Assembly

A mounting frame with continuous longitudinal members is not required when the floor assembly of the body can assume the function of the mounting frame.



# Frame and Chassis

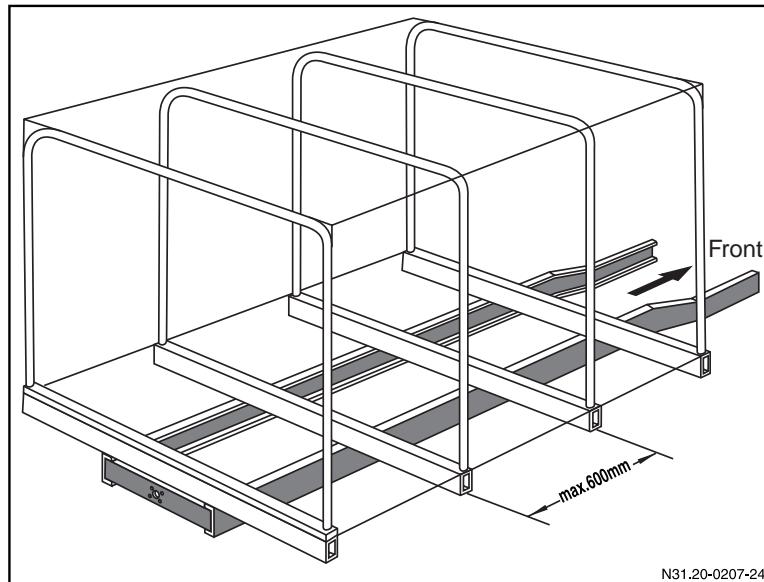
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## 3.5 Types of Bodies

members if the cross members are installed at maximum intervals of 600 mm.

### 3.5.1 Self-Supporting Bodies

Self-supporting van or box-type bodies do not require mounting frames with continuous longitudinal



# Frame and Chassis

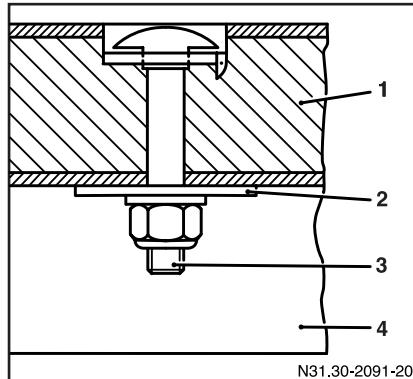
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If required the maximum interval of 23 inches may be exceeded in the area of the rear axle.

Self-supporting van or box bodies can be mounted directly to the mounting bracket on the chassis frame using a floor frame.

Attach each mounting bracket with 2 bolts ensuring that the strength of the bolts is adequate to secure the body to the frame.

1. Floor frame
2. Mounting bracket
3. Bolt
4. Chassis frame



# Frame and Chassis

## 3.5.2 Platform, Van and Box-Type Bodies

- Park vehicle on a level, horizontal surface to install the body.
- The body must be mounted with a mounting frame (C-Section longitudinal members) to ensure that the chassis frame is loaded uniformly.
- The body must be in contact with the longitudinal chassis-frame members without distortion.
- The longitudinal members of the mounting frame must be positioned as far forward as possible so that they cover the torsionally critical point behind the cab, thus preventing vibration problems.
- If loads are concentrated at points of small areas on the standard platform (e.g. transport of cable drums, coils etc.) reinforce substructure and platform as required to support the load.
- Before mounting body, weigh chassis and establish body length.



### WARNING

Disregarding these directions may seriously harm the structural integrity of the vehicle, its road worthiness and its safety. This may lead to an accident and serious injury or death.

#### Platform body

Moment of resistance for longitudinal mounting-frame members, see table on page 3.16.

For channel dimensions of longitudinal mounting-frame members, see diagram on page 3.6.

## 3.5.3 Loading Cranes

The crane size must be matched to the chassis size.

Ensure that the vehicle is stable when crane is in use.  
Limit sewing range of crane as required.



### WARNING

**Disregarding these directions may cause the vehicle to tip over. This may lead to serious injury or death.**

### 3.5.3.1 Loading crane mounted behind cab

The loading crane and supporting structure must not have an effect on the operation of other components.

Mount loading crane on a steel mounting frame.

#### Mounting frame

- Maximum moment on loading crane ( $kN \times l$ ): 25 kNm
- Moment of resistance ( $W_X$ ) for mounting frame longitudinal member:  $45 \text{ cm}^3$
- For channel dimension of longitudinal mounting-frame members, see page 3.16. The dimension for the longitudinal mounting-frame members in the area of a platform or dump truck bodies are given in the table

for platform bodies and dump truck bodies on page 3.17.

- To prevent vehicle tipping, install outriggers for each crane. We recommend hydraulic outriggers.
- To prevent frame damage do not lift vehicle with outriggers.
- To avoid accidents mark outriggers extending beyond the vehicle during stationary operation with conspicuous colors, reflectors and warning lights.
- Calculate the platform length according to the position and weight of the loading crane. Do not exceed permissible axle loads.
- Do not exceed maximum crane load moments. The crane mount must be reinforced. To prevent vehicle tipping, use vehicle only on level, paved roads.
- The resulting load distribution may make extension of the frame necessary.



### WARNING

**Disregarding these directions may cause the vehicle to tip over. This may lead to serious injury or death.**

# Frame and Chassis

## 3.5.4 Dump Truck Bodies

### Articulated bearings:

- On 3-way and rear dump truck bodies, position the rear articulated bearing as close as possible to the rear axle.
- The lowered tailgate must not strike the end of the frame, the lighting equipment nor the trailer towing hitch.
- Provide guide brackets for the front articulated bearings to guide the articulated bearings when the platform is lowered.

### Safety precautions:

- The arrester cables should hang down slightly in the end position.
- Install a folding support to prevent the platform from dropping.
- To prevent an accident, the control elements must be protected from unintentional operation.
- When the dump body is not completely tilted back into driving position, the driver must be warned by an indicator lamp.



### WARNING

Disregarding these directions reduces the operational safety of the vehicle. This can lead to an accident, and, as consequence, serious injury or death.

### Tilting press:

- The press carrier must be secured to cross members in the mounting frame.
- If possible, align the mounting frame and chassis cross members with each other.
- Three-way dump truck bodies:  
The point of force application of the tilting press should be in front of the center of gravity of the body and payload.

### Mounting frame:

- The mounting frame must be manufactured of steel, without joints and with sufficiently large cross members.
- Close the rear area to the box and reinforce with a diagonal cross or other suitable method.
- Weld guide plates to the mounting frame in the area of the cross members to prevent lateral movement.

# Frame and Chassis

---

Vehicle	Moment of resistance ( $W_X$ ) per longitudinal member in $\text{cm}^3$
2500	45
3500	60

## Channel dimensions and mounting frame sectional modules:

The values given refer to standard operational conditions.

## 3.5.5 Roll-Off and Removable Dump Truck Bodies

These guidelines apply similarly to roll-off removable dump bodies.

- To avoid damage to frame do not allow the front axle to lift when mounting or removing.
- Attach supports at end of vehicle.
- Ensure the stability of the vehicle during the loading and unloading procedures.



**WARNING**

Disregarding these directions reduces the operational safety of the vehicle. This can lead to an accident, and, as consequence, serious injury or death.

# Frame and Chassis

---

## 3.5.6 Longitudinal Reinforcement with Unladen Front Axle

When working with a lifting hoist, the entire vehicle may be lifted on 4 hydraulic pillars: The wheels lose all contact with the ground. Due to heavy weight of the front of the vehicle, this causes impermissibly high tension in the longitudinal frame members in the area of the front support.

A reinforcement of the chassis frame is essential for applications. To this end, fit a mounting frame through the rear wall of the cab under the base of the seats and secure this with an additional console and a bolt connection.

## 3.6 Spare Tire

Prior to mounting an additional spare tire to the Sprinter, make sure that all applicable national statutory standards and regulations are observed.

Spare tires must be mounted below the frame at the side of the frame or on the Sprinter body according to the vehicle technical drawings.

Ensure that the spare tire is easily accessible.



### WARNING

To prevent injury and accidents, secure spare tire with at least two separate fastening systems, which provide redundant attachment.

# 4

## Cab

Seat Belts and Airbag .....	4.1
Modifications of Cab other than Seat Belts or Airbag or Restraint System .....	4.4

# Cab

---

## 4.1 Seat Belts and Airbag

### Compliance with Vehicle Safety Standards for Seat Belts

**Note:** The Sprinter, when completed by DCAG, conforms with all applicable national standards, including but not limited to FMVSS/CMVSS 208, FMVSS/CMVSS 209, FMVSS/CMVSS 210.

Any alteration of the seat location, seat belts, seat belt anchorage points, seats, seat anchorage point, cab and support structure as well as cab underbody may void this certification. Alterations may require certification. Please see **section 1.3.3 and 1.6** for Intermediate Stage/Final Stage Manufacturers regulatory responsibility and consult with an attorney.

### Seat, Seat Belts and Air Bags



#### **WARNING**

Alteration of seat location, seat belts, seat belt anchor points, seats, seat, seat anchor points, cab and support structure as well as cab under body may result in system failure, bodily injury or death.

Seat belts, belt tensioners and airbags are independent restraint systems whose functions complement each other.

For the safety of all occupants, seats, seat belts and airbags must be used properly. Do not tamper with, disconnect, or deactivate seat belt or airbag systems.



## WARNING

Do not seat children less than 5 feet tall or 12 years and under in the front seats. Do not remove labels regarding placement of children less than 5 feet tall or 12 years and under in the front.

Do not modify the components or electrical wiring of the restraint systems, including the installation of additional trim material, badges, etc. over the steering wheel hub or front door trim panels and installation of additional electrical/electronic equipment on or near restraint system components and wiring.

Do not make any alterations or install additional components in areas designated in Diagram (see page 4.4). Alterations or installation of additional components in the designated areas shown in diagram can lead to restraint systems triggering incorrectly or failing.

Any work on the restraint systems should only be carried out by an authorized Sprinter dealer.

Damaged seat belts or belts stressed in an accident must be replaced and their anchorage points checked. Use only belts installed by an authorized Sprinter dealer.

**Do not pass belts over sharp edges.**

**Do not make any modifications that could change the effectiveness of the belts. Airbag and tensioners are designed to function on a one-time-only-basis. An airbag or belt tensioner that was activated must be replaced.**

**An airbag system component integrated in the steering wheel gets hot after the airbag has inflated. Do not touch!**

**When scrapping the airbag unit or emergency tensioning reactor, follow the Sprinter safety instructions. These instructions are available at authorized Sprinter dealers.**

**Given the considerable deployment speed and textile structure of the airbag, there is the possibility of injuries and even death resulting from airbag deployment.**

# Cab

---

## Safety Precautions for the Airbag



### **WARNING**

Airbags can cause serious injury or death. Do not position the seat closer than designed by DCAG. Do not move the seat anchorage points.

Do not position objects on the airbag or between the airbag and the vehicle's occupants.

Do not touch any hot parts after the airbag has inflated.

Covering the padded steering wheel or attaching labels or stickers to the padded steering wheel may reduce the functionality of airbags.

Do not modify any components of the restraint system or their wiring.

Observe relevant safety precautions when scrapping airbag units. Any authorized Sprinter dealer can provide information and assistance.

To ensure airbag functionality and to prevent inappropriate deployment airbags should be replaced by an authorized Sprinter dealer after 15 years.

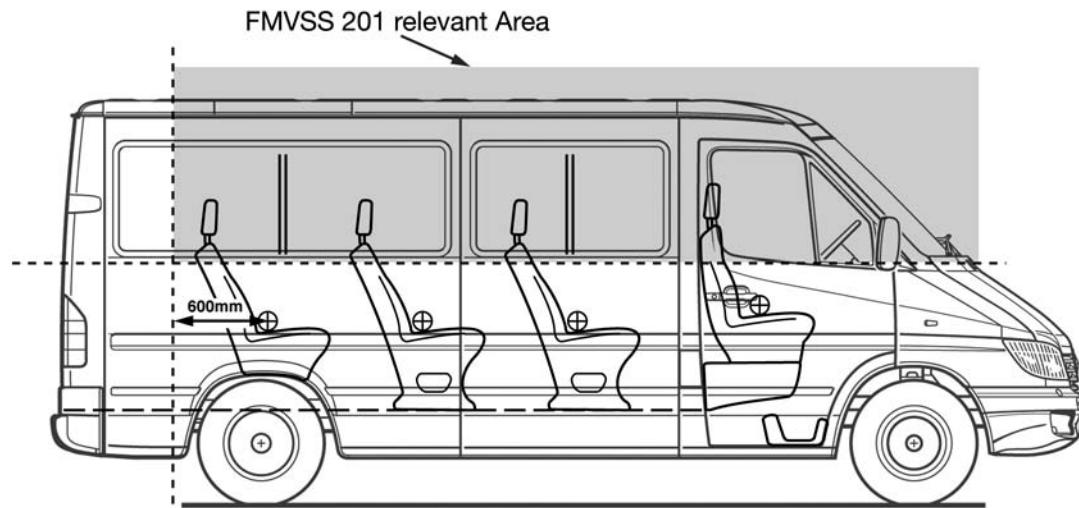


### **WARNING**

Any modifications to the dashboard or additional installations to the dashboard can void the FMVSS 201 certification. Do not modify the dashboard or install anything on the dashboard.

## 4.2 Modifications of Cab other than Seat Belts or Airbag or Restraint System

Depiction of zones relevant for FMVSS 201:



# **Cab**

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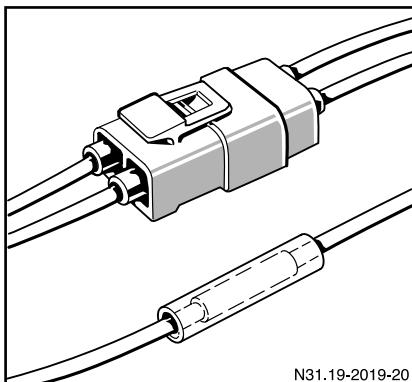
# 5

## Electrical System

Electrical Center/Expansion .....	5.1
Wiring System .....	5.2
Battery Box Location .....	5.3
Power Supply for Auxiliary Equipment .....	5.3
Electrical Installation of Mobile Communication Systems .....	5.4
Electro Magnetic Compatibility .....	5.5
Connection of the Clearance Lamps .....	5.6
Connection of the Third Brake Lamp .....	5.8

# Electrical System

## 5.1 Electrical Center/Expansion



N31.19-2019-20

Wiring connections

### General guidelines:

- Never loosen or move the battery connection terminals while the engine is still running.
- Quick charge battery only after disconnecting it from the vehicle's electrical system. Both positive and negative terminal must be disconnected.
- Please see section 5.4 for notes on the installation of additional electrical equipment/devices.
- Only use cables with fire-proof jackets in the vicinity of the exhaust systems.
- Route cables in such a manner that there is no possibility of chafing.



### **WARNING**

Disregarding these instructions can lead to electrical malfunctions. This can cause an accident, and, as consequence, serious injury or death.

## 5.2 Wiring System

Always observe the following points and guidelines when extending the electrical wiring:

- Only use wires with reduced insulation gauge and wires with the same cross-section and same color code as the standard wires supplied by DCAG.
- The wires must be jacketed with an insulating sheath.
- Only use connectors that are approved by DCAG.
- Connect only electrical wires with junction boxes
- ABS cables may only be extended with wiring harnesses that were approved by DCAG.
- In case of structural modifications to the vehicle, the routing of the electrical wires must be left unchanged to the extent possible.
- Wire routing must avoid crossing sharp edges and routing through narrow cavities or in the vicinity of moving components.
- Longitudinal tension in the wiring harness must be avoided under all circumstances.
- Cable guides into equipment, junction boxes or similar components outside the passenger compartment must be waterproofed.



### WARNING

Disregarding these directions can lead to electrical malfunctions. This can cause an accident, and, as a consequence, serious injury or death.

# Electrical System

---

## 5.3 Battery Box Location

An additional battery may only be installed in conjunction with a D + relay. This battery may only be used to power defined auxiliary devices such as auxiliary heating or air conditioning, a loading tailgate, etc. If the auxiliary battery is located in the passenger compartment, it is essential that the breather venting is fed into the open air through a central vent hose.



### WARNING

**Failure to provide for adequate ventilation of any additional battery may lead to contamination of the passenger compartment and may cause serious injury or death.**

## 5.4 Power Supply for Auxiliary Equipment

Observe the following when retrofitting additional electrical equipment:

- Body Builders and consumers can order Sprinters with batteries and alternators with higher power ratings.
- Do not splice additional loads to the existing fuses already in use.
- Do not connect additional lines to present lines (quick clamp connectors are not permitted)
- Install additional fuses to provide an adequate number of fuses for additional equipment.

Additional electrical circuits must only be connected at the terminal strip for auxiliary consumers (code EK1) available in the completed vehicle. The terminal strip, which has three connections, is located inside the vehicle on the rear of the base of the driver's seat:

1. Terminal D+      12 V/10 A
2. Terminal 30      12 V/25 A
3. Terminal 15      12 V/25 A



## **WARNING**

Improper work on or incorrect installations in the vehicle electrics/electronics could lead to electrical malfunctions. This could lead to an accident, and, as consequence, serious injury or death.

Note: Improper work on or incorrect installations in the vehicle electrics/electronics could endanger the vehicle's operating safety and / or invalidate the vehicle's warranty.

## **5.5 Electrical Installation of Mobile Communication Systems**

When mobile communication systems, e.g., cell-phones, CB radios, are retro-fitted the following requirements must be fulfilled in order to avoid vehicle malfunctions.

### **5.5.1 Communication Equipment**

Communication equipment must have an FCC number and has to comply with CISPR25. The equipment must be permanently installed. Operation of portable or mobile equipment inside of the vehicle is permissible only when connected to a permanently installed aerial/antenna outside of the vehicle. Always install transmitter stage specially insulated from the vehicle's electronics system. Also always protect the equipment from moisture and observe permissible operating temperatures. Protect the equipment against heavy mechanical vibration.

### **5.5.2 Aerial for Radio Equipment**

Observe the radio equipment manufacturer's notes and installation instructions. The aerial/antenna must have a FCC number.

# **Electrical System**

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## **5.5.3 Connection and Routing of Equipment Wiring**

Always connect the equipment directly to terminal 30 via an additional fuse. When routing lines, keep them as short as possible and avoid loops. Do not twist cables. Always ensure that the aerial and electrical equipment have good ground connection to the vehicle body. Aerial cables connecting lines between the transmitter, receiver and operating panel must be separated from the body ground with a wiring harness.

Never kink or pinch the antenna line.

## **5.6 Electro Magnetic Compatibility**

Individual appliances may cause interference with the Sprinter's electrical systems. All electronic components installed by DCAG have been initially checked for their electromagnetic compatibility with all vehicle components and electrical systems.

When retrofitting electrical or electronic systems/equipment it is necessary to check their electromagnetic compatibility.

The following standards provide information on electromagnetic compatibility:

- ISO 11451
- ISO 11452
- CESPR 25
- MBS22100

For additional information, please contact DCMC and DCV's designee, the Engineering/Compliance Department at DaimlerChrysler Manufacturing International LLC.



## **WARNING**

**Operating cell phones or other radio telecommunications equipment with an aerial inside the vehicle can interfere with the operation of the vehicle and cause a safety hazard.**

**Note:** If a cell phone or a two-way radio has been retrofitted without complying with the manufacturer's installation requirements, the vehicle's warranty may be voided.

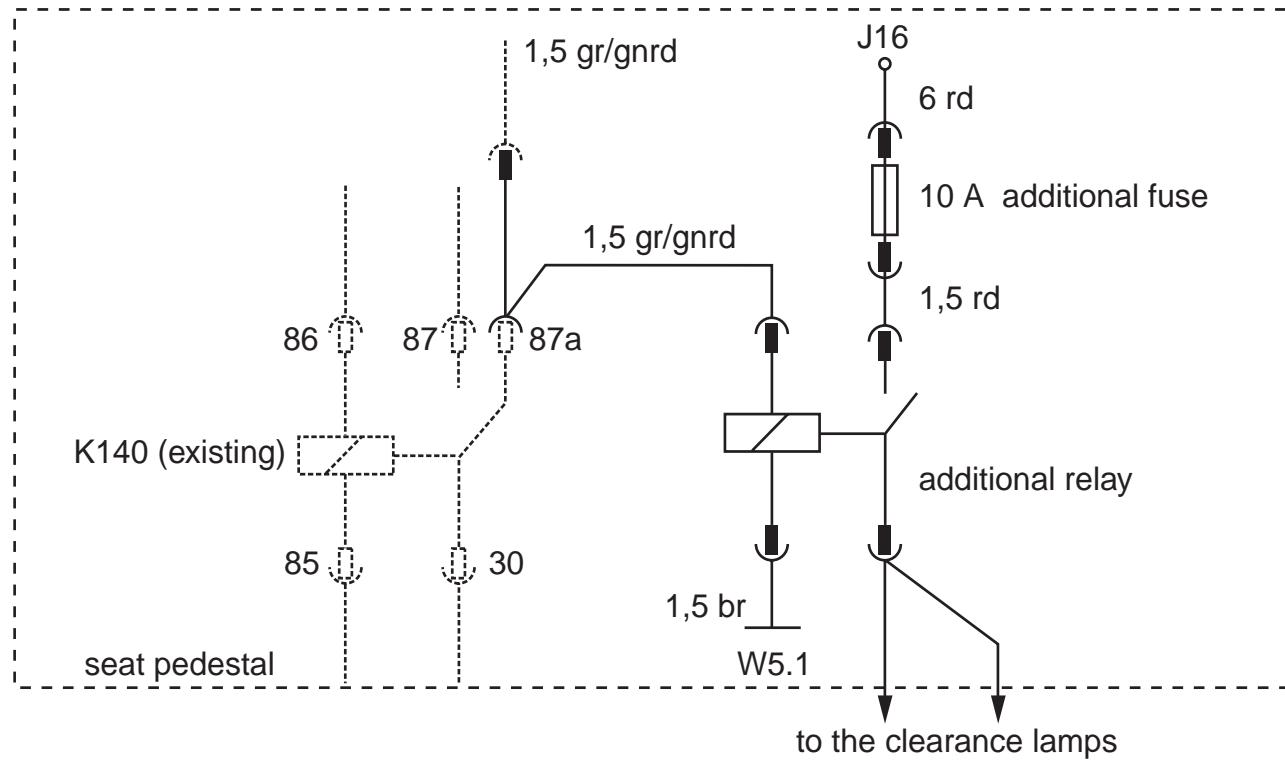
## **5.7 Connection of the Clearance Lamps**

The clearance lamps must be connected to the end connector J16 by a cable  $6\text{mm}^2$ , rd and an additional fuse 10A. The fuse output must be connected to the terminal 87 of an additional relay for the clearance lamps by a cable  $1.5\text{mm}^2$ , rd. The terminal 30 of this relay must be connected to the front and rear clearance lamps by a twin-connection.

To control the additional relay, the cable  $1.5\text{mm}^2$  gr/gn rd must be branched at the existing relay K140, terminal 87a and connected to the additional relay, terminal 86. The terminal 85 of the additional relay must be connected to the ground connection W5.1 (see wiring diagram).

# Electrical System

Connection of the Clearance Lamps



# Electrical System

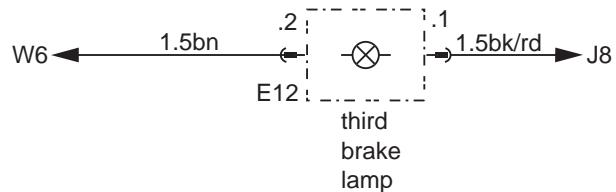
To install the clearance lamps, DCMC and DCV recommend only the following parts released by DCAG:

End connector	A 001 546 87 41
Relay	A002 542 14 19
Socket	A006 545 07 28
Plug housing, 1-pole	A 002 545 10 28
Plug socket housing, 1-pole	A 002 545 10 28
Fixing parts	A 002 545 10 28
Fuse	N 072581 000304

## 5.8 Connection of the Third Brake Lamp

The third brake lamp must be connected to the end connector J8 by a cable  $1.5\text{mm}^2$ , bk/rd. The end connector is situated in the engine compartment and must be waterproof.

The connection to the ground is realized by a cable  $1.5\text{mm}^2$ , bn to the ground connection W6 (see wiring diagram):



N82.25-2049-00

Connection of the third brake lamp

# **Electrical System**

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# 6

## Brake System

Modifications to Brake System . . . . .	6.1
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# **Brake System**

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## **6.1 Modifications to Brake System**

**Caution!** The Sprinter, "as delivered" by DCMC and DCV complies with all applicable national standards, including but not limited to FMVSS/CMVSS 105/106/116.

Any alteration of the brake system may void this certification and cause a safety hazard. Recertification may be necessary! Please contact DCMC and DCV's designee, DaimlerChrysler Manufacturing International LLC Engineering and Compliance Department for additional information.



### **WARNING**

**Any alterations of the Sprinter's brake system may affect the vehicle's ability to stop. Serious injury or death may be the result!**

# 7

## Fuel System

Fuel Tank Specification and Location .....	7.1
Modifications of Fuel System .....	7.1

# Fuel System

## 7.1 Fuel Tank Specification and Location

See offer drawings of the passenger Van for the fuel tank location.

## 7.2 Modifications of Fuel System



### WARNING

**Do not move or replace the fuel system. Movement or replacement of the fuel system may lead to fire, serious injury or death.**

The Sprinter, "as delivered" by DCMC and DCV conforms with all applicable national standards, including but not limited to FMVSS/CMVSS 301.

Any alteration of the fuel system may void this certification. Recertification may be necessary.



### WARNING

Always handle fuel and the fuel tank with great care. Fuel is flammable and explosive.

Keep open flames away from the fuel. Do not perform any work on the fuel system without verifying that the fuel filler neck is connected to the vehicle's ground point. If the fuel filler neck is not connected to the vehicle's ground point, there is a risk of fire or explosion, which may lead to serious injury or death!

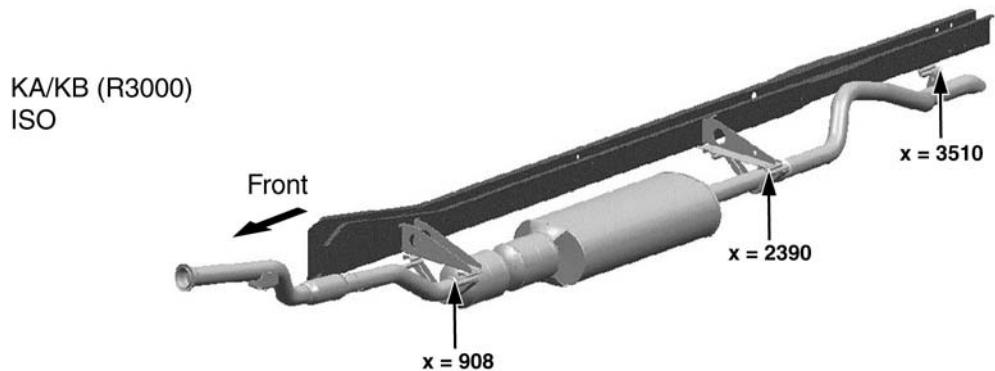
# 8

## Exhaust System

System Layout/Location/Specifications .....	8.1
Oxidation, Catalytic Converters .....	8.4
Modifications of Exhaust Systems Other Than Catalytic Converters .....	8.4

# Exhaust System

## 8.1 System Layout/Location/ Specifications



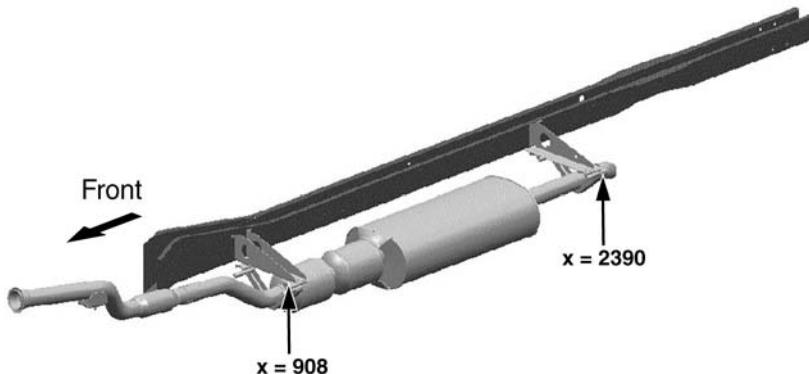
# Exhaust System

KA/KB (R3000)

View from below



cab  
ISO



# Exhaust System

cab

View from below



## 8.2 Oxidation, Catalytic Converters

The material /...../ (see installation pages 8.1-8.3) bracketry of the exhaust type, type of exhaust, connector system from turbocharger outlet to the oxidation catalytic converters, including the converters and muffler themselves, must not be altered. Any alterations will invalidate EPA exhaust emission certification.

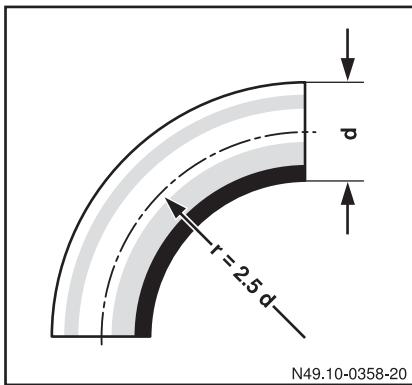
## 8.3 Modifications of Exhaust Systems Other Than Catalytic Converters

- When modifying the exhaust systems other than the catalytic converters, follow the guidelines below.
- Use only original parts for modifications to the exhaust system.
- It is not permissible to change the length or installed position of the flexible metal hose between the exhaust manifold and the exhaust pipe.
- Do not reduce the free cross-section of the exhaust pipe behind the muffler.
- Pipe elbow should not exceed 90°.
- Avoid additional pipe elbows.

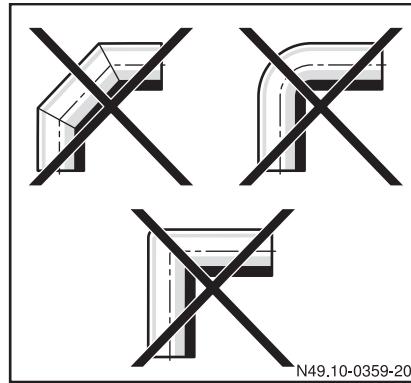
- Bending radii must be  $> 2.5 d$ .
- Minimum distance from plastic lines, electrical harness and spare tires:
  - 200 mm for exhaust system without shielding,
  - 80 mm for sheet metal shielding,
  - 40 mm for sheet metal shielding with additional insulation.
- Additional heat shield is required in the area of control elements and the area of assemblies, attachments and installed parts made from non-heat resistant materials.
- No modifications are permissible to the exhaust system from the engine to the rear of the catalytic converter.

# Exhaust System

---



Bending radii



# 9

## Engine System

Engine Specifications .....	9.1
Engine Air Intake .....	9.2
Engine Cooling System .....	9.2
Modifications of Engine Systems other than Air Intake and Cooling Systems .....	9.2

# Engine System

## 9.1 Engine Specifications

Designation/Engine	OM612LA / OM647LA
Number/arrangement of cylinders	5 cylinders in line
Engine type	turbocharged engine with charge air cooling
Injection	Common Rail Direct Injection with valve-covered orifice injection nozzles
Number of valves per cylinder	4 (2 intake/2 exhaust)
Bore (in.)	3.46
Stroke (in.)	3.48
Piston displacement (cu. in.)	164
Compression ratio	18 : 1
Engine output (hp) *	154
@ rpm	3,800
Torque (lb.-ft)	244
@ rpm	1,600 - 2,400
Engine weight (kg)	approx. 217**

\* according to SAE J 1349

\*\* includes oil, ring gear and all auxiliary devices including the air-conditioning compressor

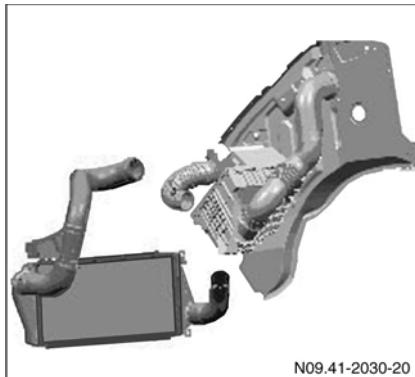
# Engine System

## 9.2 Engine Air Intake

**Note:** The Sprinter, "as delivered" by DCMC and DCV conforms with the EPA Emission Standards, relating to air intake manifold temperature, air intake system pressure drop, etc.

Any alteration of the air intake and air cooling system may void this certification. Recertification may be necessary.

Contact DCMC and DCV's designee, DaimlerChrysler Manufacturing International LLC for additional information.



N09.41-2030-20

## 9.3 Engine Cooling System

Do not modify the engine cooling system, radiator, radiator grill, air ducts, cooling circuits, etc.

A sufficient quantity of incoming ambient air must flow through radiator/charge aircooler at all times. Always keep the radiator/charge aircool air inlet clear. Never attach warning signs, plates or other ornamental parts in the area in front of the radiator.



### **WARNING**

Obstruction to radiator cooling airflow may result in overheating and serious engine damage!

## 9.4 Modifications of Engine Systems other than Air Intake and Cooling Systems

Provide for additional cooling devices for assemblies when operating the Sprinter at outside temperature exceeding 35° C or operating the vehicle in a stationary manner and supplying high continuous output.

# **Engine System**

# 10

## Axles

Front Axles Specifications .....	10.1
Rear Axle Specifications .....	10.1
Axle Track and Overall Width .....	10.1
Ground Clearance .....	10.1
Steerability .....	10.1

# Axles

---

## 10.1 Front Axles Specifications

Front axle with individual wheel suspension, transversal leaf parabolic springs, shock absorber and stabilizer bar.

## 10.2 Rear Axle Specifications

Rear axle with standard rear axle ratio  $i = 3,727$  (optional  $i = 4,111$ ), parabolic springs and stabilizer bar as standard (reinforced stabilizer bar as an option on vehicles with 9,990 GVW)

## 10.3 Axle Track and Overall Width

Observe all specifications in the offer technical drawings.  
See Diagram.

## 10.4 Ground Clearance

Observe all specifications in the offer technical drawings.  
See Diagram.

## 10.5 Steerability

Any modifications or alterations on axles, suspension dampers and stabilizers may detrimentally affect the roadworthiness of the vehicle.

# 11

## Rear Suspension

Modifications of Leaf and Coil Springs .....	11.1
--	------

# **Rear Suspension**

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## **11.1 Modifications of Leaf and Coil Springs**

Only use original leaf and coil springs approved by DCAG. Do not damage the surface or corrosion protection of the spring leaf. Before welding always cover the springs to protect against welding spatter. Never touch the springs with welding electrodes and welding tongues.

Installing additional spring leaf is not permitted.

Damaged springs must be replaced.

# 12

## Tires and Wheels

Tire and Wheel Specifications .....	12.1
Loading the Vehicle .....	12.2

# Tires and Wheels

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## 12.1 Tire and Wheel Specifications

Model	Tires	Wheels
2500	225/70 R 15 C	6J X 15 H2
	225/75 R 16 LT (140" and 158" wheelbases)	6J X 16 H2
3500	195/70 R 15 C	5 1/2J X 15 H2 (rear axle with dual wheels)
	225/75 R 16 LT (Cab - Chassis)	6J X 16 H2

## 12.2 Loading the Vehicle

Two labels on the vehicle show how much weight it may properly carry.

- The Tire and Loading Information Label can be found on the driver's door B-pillar. This label tells you important information about the number of people that can be in the vehicle and the total weight that can be carried in the vehicle. It also contains information on the proper size and recommended tire inflation pressures for the original equipment tires on the vehicle.
- The Certification Label can be found below the driver's seat on an outward facing position of the mounting pillar. It tells you about the gross weight capacity of your vehicle, called the Gross Vehicle Weight Rating (GVWR). The GVWR includes the weight of the vehicle, all occupants, fuel and cargo. The Certification Label also tells you about the front and rear axle weight capacity, called the Gross Axle Weight Rating (GAWR). The GAWR is the total allowable weight that can be carried by a single axle (front or rear). Never exceed the GVWR or GAWR for either the front axle or rear axle.

Following is a discussion on how to work with the information contained on the two labels with regards to loading your Sprinter vehicle.

### 12.2.1 Tire and Loading Information



#### WARNING

**Do not overload the tires by exceeding the specified load limit as indicated on the Tire and Loading Information label on the driver's door B-pillar. Overloading the tires can overheat them, possibly causing a blowout. Overloading the tires can also result in handling or steering problems, or brake failure.**

**Overloading of tires is dangerous. Overloading can cause tire failure, affect vehicle handling, and increase the stopping distance. Use tires of the recommended load capacity for the vehicle. Never overload them.**

**The vehicle maximum load on the tire must not exceed the load carrying capacity of the tire on your vehicle. You will not exceed the tire's load carrying capacity if you adhere to the loading conditions, tire size and cold tire inflation pressures specified on the Tire and Loading Information label and this section.**

# Tires and Wheels

## Tire and Loading Information Label



1. Seating capacity
2. Load limit information

NOTE: Data shown on label is for illustration purposes only. Load limit data and seating data are specific to each vehicle and may vary from data shown in the illustration. Refer to label on vehicle for actual data specific to your vehicle.

## Seating Capacity

The seating capacity (1) gives you important information on the number of occupants that can be in the vehicle. Observe front and rear seating capacity.

Never let more people ride in the vehicle than there are designated seating positions and seat belts available. Be sure everyone riding in the vehicle is correctly restrained with a separate seat belt.

## Load Limit Information

Locate the statement "The combined weight of occupants and cargo should never exceed XXX kilograms or XXX lbs." (2) on the Tire and Loading Information label. The combined weight of all occupants, cargo/luggage and trailer tongue load (if applicable) should never exceed the weight referenced in that statement.

## Steps for Determining Correct Load Limit

The following steps have been developed as required of all manufacturers under Title 49, Code of U.S. Federal Regulations, Part 575 pursuant to the "National Traffic and Motor Vehicle Safety Act of 1966".

### Step 1

- Locate the statement "The combined weight of occupants and cargo should never exceed XXX kg or XXX lbs." on your vehicle's label.

### Step 2

- Determine the combined weight of the driver and passengers that will be riding in your vehicle.

### Step 3

- Subtract the combined weight of the driver and passengers from XXX kilograms or XXX lbs.

### Step 4

- The resulting figure equals the available amount of cargo and luggage load capacity. For example, if the "XXX" amount equals 1400 lbs. and there will be five 150 lbs. passengers in your vehicle, the amount of available cargo and luggage load capacity is 650 lbs. ( $1400 - 750 (5 \times 150) = 650$  lbs.)

### Step 5

- Determine the combined weight of luggage and cargo being loaded on the vehicle. That weight may not safely exceed the available cargo and luggage load capacity calculated in step 4.

### Step 6 (if applicable)

- If your vehicle will be towing a trailer, load from your trailer will be transferred to your vehicle. Refer to "Trailer Tongue Load" to determine how this reduces the available cargo and luggage load capacity of your vehicle.

The following table shows examples on how to calculate total load, cargo load and towing capacities with varying seating configurations and number and size of occupants. The following examples use a load limit of 1500 lbs.

**NOTE:** This is for illustration purposes only. Make sure you are using the actual load limit for your vehicle stated on the vehicle's Tire and Loading Information Label.

# Tires and Wheels

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Example	Combined weight limit of occupants and cargo from label	Number of occupants (driver and passengers)	Seating configuration	Occupants weight	Combined weight of all occupants	Available cargo/luggage and trailer tongue weight (total load limit from label minus combined weight of all occupants)
1	1500 lbs	5	front: 2 rear: 3	Occupant 1: 150 lbs Occupant 2: 180 lbs Occupant 3: 160 lbs Occupant 4: 140 lbs Occupant 5: 120 lbs	750 lbs	1500 lbs – 750 lbs = 750 lbs
2	1500 lbs	3	front: 1 rear: 2	Occupant 1: 200 lbs Occupant 2: 190 lbs Occupant 3: 150 lbs	540 lbs	1500 lbs – 540 lbs = 960 lbs
3	1500 lbs	1	front:1	Occupant 1: 150 lbs	150 lbs	1500 lbs – 150 lbs = 1350 lbs

The higher the weight of all occupants, the less cargo and luggage load capacity is available.

For more information, refer to "Trailer Tongue Load".

# Tires and Wheels

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## Certification Label

Even after careful determination of the combined weight of all occupants, cargo and the trailer tongue load (if applicable) as to not exceed the permissible load limit, you must make sure that your vehicle never exceeds the Gross Vehicle Weight Rating (GVWR) and the Gross Axle Weight Rating (GAWR) for either the front or rear axle.

Under a maximum loaded vehicle condition, gross axle weight ratings (GAWR's) for the front and rear axles must not be exceeded.

To determine the maximum loading conditions of your vehicle, locate the statement "The combined weight of occupants and cargo should never exceed XXX kg or XXX lbs." on the Tire and Loading Information label. The combined weight of occupants, cargo/luggage and trailer tongue weight (if applicable) should never exceed the weight referenced here.

You can obtain the GVWR and GAWR from the Certification label. The Certification Label can be found below the driver's seat on an outward facing position of the mounting pillar.

For more information, refer to "Trailer Tongue Load".

## Gross Vehicle Weight Rating (GVWR):

The total weight of the vehicle, all occupants, all cargo, and the trailer tongue load must never exceed the GVWR.

## Gross Axle Weight Rating (GAWR):

The total allowable weight that can be carried by a single axle (front (FA) or rear (RA)).

Sprinter Type	GVWR	GAWR (FA)	GAWR (RA)
2500 C/HC/SHC	8550 lbs (3878 kg)	3860 lbs (1751 kg)	5360 lbs (2431 kg)
3500 C/HC/SHC	9990 lbs (4531 kg)	3860 lbs (1751 kg)	7060 lbs (3202 kg)
	10200 lbs (4627 kg)	3860 lbs (1751 kg)	7060 lbs (3202 kg)

To assure that the vehicle does not exceed the maximum permissible weight limits (GVWR and GAWR for front and rear axle), have the loaded vehicle (including driver, passengers and all cargo and, if applicable, trailer fully loaded) weighed on a suitable commercial scale.

# Tires and Wheels

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## Trailer Tongue Load

The tongue load (tongue weight at the hitch ball) of any trailer is an important weight to measure because it affects the load you can carry in your vehicle. If a trailer is towed, the tongue load must be added to the weight of all occupants riding and any cargo you are carrying in the vehicle to prevent exceeding your Sprinter tow vehicle's rear GAWR. The tongue load typically is between 10 % and 15 % of the trailer weight and everything loaded in it.

For example, if the trailer tongue load equals 140 lbs. and the determined available cargo/luggage and trailer tongue weight equals 750 lbs., the amount of available cargo and luggage load capacity is 610 lbs. ( $750 - 140 = 610$  lbs.)

# 13

## Other Additional Information

Special Notes on Loading Tail Gates .....	13.1
Special Notes on Trailer Coupling and Towing .....	13.1
Special Notes on Wind Deflectors and Wind Screens .....	13.4
Special Notes on Bolted and Welded Connections .....	13.4
Special Notes on Noise Reduction .....	13.5
Special Notes on the Installation and Use of Roof Racks .....	13.7
Special Notes on Modifications to Passenger and Cargo Vans .....	13.8
Special Notes on Damage Prevention .....	13.10

# Other Additional Information

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## 13.1 Special Notes on Loading Tail Gates

Observe the following instructions when installing loading tail gates to the Sprinter:

- Loading tail gates must conform with all national accident prevention regulations and guidelines.
- When installing tail gates, ensure that the permissible rear axle load is not exceeded.
- Comply with the front minimum axle load.
- Test the loading tail gate stability only when the vehicle is stationary.
- When installing an electro-hydraulic loading tail gate, provide a heavy duty alternator and sufficient battery power.
- Provide adequate underride protection and position lights.
- The platform height must not exceed 1,000 mm, and the load distance must not exceed 500 mm.
- Stabilizers are necessary on the front and rear axles.



### WARNING

Disregarding these directions may cause the vehicle to tip over. This may lead to serious injury or death.

## 13.2 Special Notes on Trailer Coupling and Towing

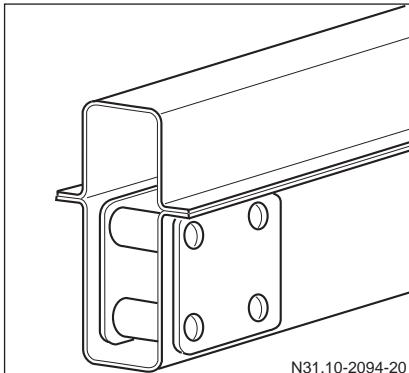
The attachment of a trailer coupling must fulfill all national laws and regulations, including but not limited to guidelines such as the ISO/R 1102. In attaching a trailer coupling, always take the clearance dimensions of the Sprinter into consideration. Please refer to ISO 1103 in this regard. When retrofitting trailer couplings, only use brands and models tested and approved by DCAG.

Maximum permissible towing capacity: 5,000 lbs

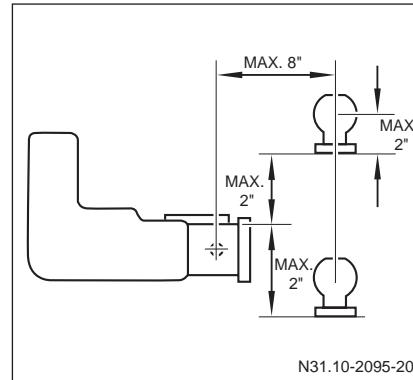
Maximum tongue weight: 500 lbs

## Other Additional Information

### **Ball head coupling**



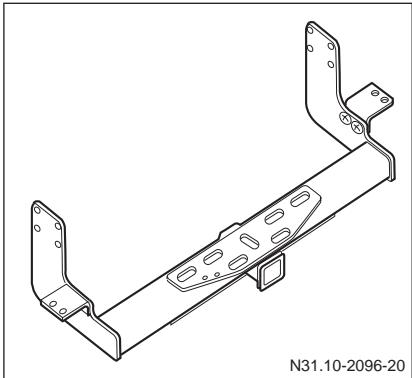
The assembly of a trailer coupling may take place only at, the frame-lateral fastening spots prescribed by DCMC or DCV's designee, DCMI Engineering.



The hitch ball adapter used should not exceed the maximum dimensions described in diagram above.

## Other Additional Information

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Only install a trailer hitch receiver approved by DCAG for use on Sprinter. For Information on availability and installation please see your authorized Sprinter Dealer.



### WARNING

The bumpers on Sprinter are not designed for use with clamp-type hitches. Do not install/attach rental hitches or other bumper-type hitches to the Sprinter.

Installation of hitches, which have not been approved by DCAG, may result in loss of trailer and as consequence serious injury or death.

## **Other Additional Information**

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### **IMPORTANT:**

Trailer tow hitch ball head coupling:

Operation instructions must be included with the vehicle indicating the special features and operation of the coupling.



### **WARNING**

**To avoid jackknifing, serious injury or death. An unladen vehicle may only be used to tow an unladen trailer.**

Always observe the trailer coupling manufacturer's instructions. Please contact DCMC or DCV's designee, DaimlerChrysler Manufacturing International LLC with questions concerning the attachment of trailer couplings.

### **13.3 Special Notes on Wind Deflectors and Wind Screens**

Wind deflectors on the roof of the Sprinter cab must be secured to the door frames or rear welding flange (roof-rear wall) with clamp bolts or with glue. Do not drill holes in the cab roof to mount wind deflectors.

Please contact DCMC and DCV's designee, DaimlerChrysler Manufacturing International LLC for additional information on the mounting of other roof attachments such as air conditioner units.

### **13.4 Special Notes on Bolted and Welded Connections**

#### **13.4.1 Welding Work**

When ark/electrical welding, the following guidelines must be observed:

- Only certified welders may perform welding on the chassis frame.
- The positive and negative terminals of the battery cover have to be disconnected.
- The ground clamp for an ark welder may only be connected directly to the part, which is welded.

# Other Additional Information

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## WARNING

Avoid any contact of the ark welder ground clamp with any of the drive train assemblies, including but not limited to, engine, transmission, and axles!

- Do not touch electronic component housings, such as airbag control modules or electric lines with welding electrodes or ground contact clamps for ark welders.
- On Sprinter cabs with insulating mountings, connect the welding equipment's earth terminal to the cab.

## 13.4.2 Bolted Connections

If serial bolts must be changed to longer ones, only bolts with

- same diameter,
- same firmness, and
- same tread pitch can be used.

## 13.5 Special Notes on Noise Reduction

Install noise insulating and flame resistant materials in order to reduce the noise level inside the Sprinter.

### 13.5.1 Body Mounting

The transmission of vibrations and structural noise can be avoided by

- Installation of resilient plastic or rubber interlays between the frame and the body.
- Installation of hollow rubber springs when mounting the body on the chassis.

The mounting must ensure of following conditions:

- High degree of rigidity of the mounting both, longitudinally and laterally.
- Limit body movement on spring deflection and rebound.
- Secure body against potential detachment.
- Avoid frame whipping to prevent vibration problems or negative effects on the riding comfort.

## Other Additional Information

### 13.5.2 Cab Platform

The cab platform including the doorway, should be isolated with a soft, flexible insulating material (weight 10 to 12 kg/m<sup>2</sup>) and with carpet including foam padding.

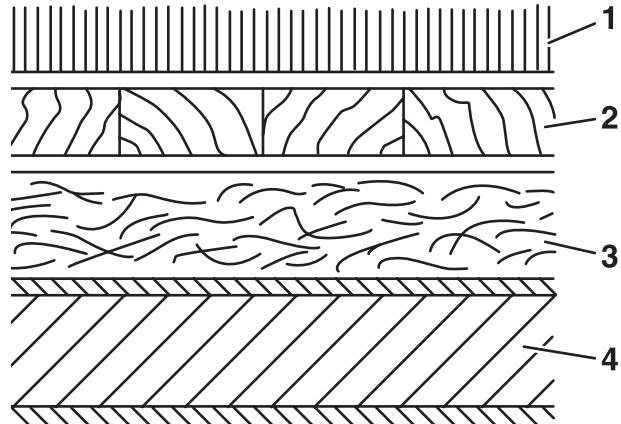
### 13.5.3 Flooring

To insulate and sound proof the floor structure, follow diagram regarding flooring structure. An additional covering with heavy insulating material may be provided in the area of the wheel wells.



#### WARNING

Certain insulating materials, for example, bituminous felt, have limited temperature resilience. Positioning such material in the immediate vicinity of the engine or exhaust system may cause fire.



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1. Carpeting (rubberized bottom side)
2. Wooden floor (plywood, 12 mm)
3. Heavy duty insulating layer (weight 8 ... 10 kg/m<sup>2</sup>)
4. Supporting structure

# Other Additional Information

## 13.5.4 Seals

Carefully seal ducts, joints and slots between the engine compartment, the underside of the vehicle, and the splashboard to the vehicle interior with resilient material. Do not position airing and ventilation openings in the immediate vicinity of sources of noise. Always consult with suppliers of soundproofing materials to ensure compliance with national safety laws and regulations.

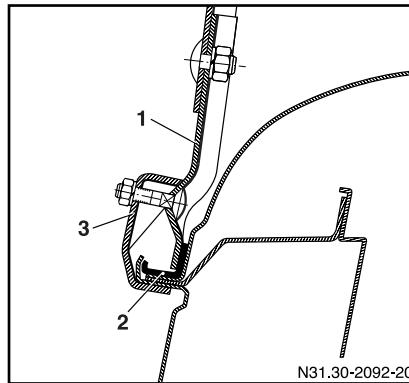
## 13.6 Special Notes on the Installation and Use of Roof Racks

Sprinters with standard box type bodies may be equipped with roof racks. When mounting the roof rack, please observe the following guidelines:

- A maximum load capacity of 300 kg on vehicles with standard roofs and 150 kg on the vehicles with high roofs is permissible if the load is evenly distributed over the entire roof area.
- A stabilizer must be installed on the front axle.
- The roof rack must have at least 5 legs on each side for a 300 kg roof load or 4 legs on each side for a 150 kg roof load. Always space the legs evenly!
- Reduce the load proportionally if a shorter roof rack is used.

### WARNING

Exceeding maximum load capacity adversely affects the center of gravity of the vehicle, reduces vehicle stability, and may cause rollover, serious injury or death.



1. Roof rack
2. Support bracket (length min. 80 mm)
3. Bracket

# Other Additional Information

## 13.7 Special Notes on Modifications to Passenger and Cargo Vans



### WARNING

The Sprinter body and chassis form a single, self supporting unit. Any modification to the vehicles body or chassis, which are not described in these guidelines, could adversely affect the vehicles structural integrity and road-worthiness. Questions whether intended modifications conform with these guidelines, should be directed to DCMC and DCV's designee, DaimlerChrysler Manufacturing International LLC, Engineering and Compliance Department.

### 13.7.1 Floor Group

On the Passenger and Cargo van, the body and the chassis form a single self-supporting unit. If converting or installing bodywork parts, only weld parts if a glued connection is not possible. Windows, roof hatches, airing and ventilation openings should therefore be enclosed in a stable frame.

This frame must be connected by a friction-locking fit to other body parts.

### 13.7.2 Windows

If box sections are cut through the side-walls for the installation of windows, the cut-outs must be reinforced with extruded/stamped frames and welded to the cut-through channels. Reinforce the connection points with gusset plates!

Ensure windows comply with all applicable laws and regulations.

### 13.7.3 Other Vehicle Parts

Vehicle parts must not protrude and constitute a danger to pedestrians or other vehicles.

## Other Additional Information

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### 13.7.4 Creating an Opening in the Roof

When creating an opening in a Sprinter roof, reinforce the opening using a profiled frame. If utilizing a profiled frame is not feasible, additional roof bows must be installed.

Height of roof	Moment of inertia IX for each roof bow
250 mm	40,000 mm <sup>4</sup>
400 mm	65,000 mm <sup>4</sup>
550 mm	86,000 mm <sup>4</sup>



#### WARNING

Above specifications are based on a plastic roof with an elasticity modulus of 7,000 N/mm<sup>2</sup>/psi and a wall thickness of 4 mm/inches.

Plastic roofs have limited suitability for installing roof hatches. The size of the roof hatch must be limited when utilizing a plastic roof to avoid roof crush, serious injury or death in case of an accident.

If a pop up roof is installed, at least two thirds of the original roof area must be retained. Do not remove struts or other load-bearing components when installing a pop up roof.

### 13.8 Special Notes on Damage Prevention

#### 13.8.1 Special Notes on the Prevention of Damage to Brake Hoses

Before welding, drilling, grinding or working with cutting disks always cover the plastic brake hoses and brake lines. Remove the brake hoses and brake lines if necessary. Check systems for pressure loss after the brake hoses and brake lines have been reinstalled.



#### ! WARNING

Any interference with the integrity of the brake system, including but not limited to, damaging the brake hoses and the brake lines, may cause brake system failure and may lead to serious injury or death.

# Other Additional Information

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## 13.8.2 Welding Work

When welding with electrical equipment, the following guide lines have to be observed:

- Only trained personal may perform welding on the chassis frame.
- The positive and negative terminals of the battery cover have to be disconnected.
- The ground clamp for an arc welder may only be connected directly to the part which is welded.

**Note:** Avoid any contact of the arc welder ground clamp with any of the drive train assemblies, including but not limited to engine, transmission, and axles!

- Do not touch electronic component housings, such as airbag control modules or electric lines, with welding electrodes or ground contact clamps for arc welders.
- On cabs with insulating mountings, connect the welding equipment's earth terminal to the cab.

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